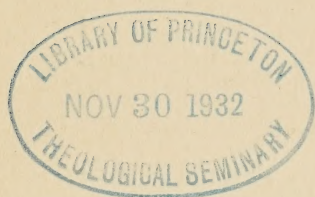


# PRACTICAL PSYCHOLOGY

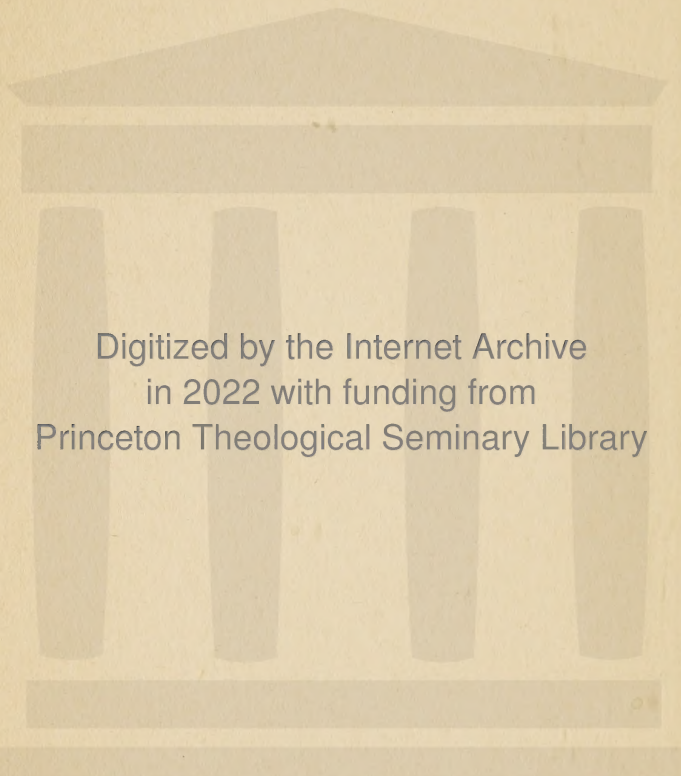
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BURT B. FARNSWORTH



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# PRACTICAL PSYCHOLOGY

FOR

MEN AND WOMEN IN THE INDUSTRIES AND  
PROFESSIONS, AND FOR THE GENERAL READER

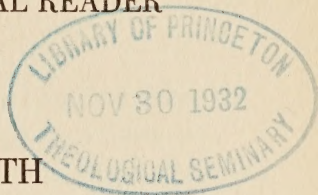
By

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APPEAL," "WHAT IS HAPPENING TO INDUSTRIAL AMERICA."

LECTURER ON PSYCHOLOGY, ETC.



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## PREFACE

It has been the aim of the author in writing Practical Psychology to make the principles so clear and to present them so interestingly that the reader may understand and enjoy the book.

This should lead to his getting better acquainted with himself and to become interested in applying the principles to his own development and to be able to recognize them when he sees them expressed in the conduct of others.

It is hoped that as he reads he will discover something of the "how" of character development and also something of the "why" and so become a more capable individual and a more important factor for good in his social group and so come to realize in fuller measure the real joy of living.

BURT BYRON FARNSWORTH.

Springfield, Mass.,

June 1, 1925.



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# PRACTICAL PSYCHOLOGY

## CHAPTER I

### MACHINE THE MIND USES

**Psychology** finds its subject matter in the experience of human individuals. Up to the early part of the last century the science was largely introspective, and most of the emphasis was placed upon the consideration of the intellect. Later the will came in for a good share of attention, and in recent years the attention has been turned more directly to the emotions. Psychologists have come to recognize that the intellect alone does not make mind, that the mind is greater than intellect, greater than will, greater than emotions. It is the sum of all of these in their various manifestations.

*I* think, feel, and will; but *I* am not thinking, feeling, and willing: *I* am more than they. They are transient, *I* am permanent. *I* have the experience of feeling, thinking, and willing. There is a continuity about myself that is not true of any, or all of them. I am a personality, and psychology that deals with my experience must deal with a personality—one that looks back upon yesterday, knows today, and plans for tomorrow.

When we think of experience, we think of something happening, or of something being done. Change has taken place and we know of the change. The change is manifested thru some form of bodily activity, or of remembered bodily activity. The fact that we are *aware* of the change lies at the basis of consciousness.

Psychology, then, must deal with experience of a personality which is conditioned by bodily activity. There must be a correlation of the psychological processes with consciousness. The study of the subject ought to make fairly clear the fundamental principles of mental activity.

**Practical Psychology** is an attempt to apply these principles to personal development and to the daily task. It is safe to say that everyone is using every day some of the principles of psychology, often without knowing what they are, just as the boy who leaves his jackknife on the back door-step over night and finds it "rusted" in the morning does not know that the rusting has anything to do with the science of chemistry. We hear of the psychology of advertising, the psychology of salesmanship, the psychology of healing, etc. Psychology has been applied in some degree to problems of formal education, by the physicians in their practice, by lawyers in dealing with criminals and with juries. In recent years many attempts have been made to apply the principles of psychology to industry, and while not much headway has been made enough has been done to make industrial leaders anxious to know more about the subject. As always happens in such cases much that is not psychology has been "sold" as the real thing. Character analysis in most cases has nothing, or very little, to do with fundamental principles of psychology. Yet psychology has a large contribution to make to personal development, to all forms of industry, and to all forms of social organization.

In every activity today except hunting and fishing one must come into contact with men. Modern civilization is based upon human contacts. Yet almost no attention has been given to putting within the reach and understanding of the common man any of the knowledge that the science of psychology has acquired. In industry the best experts are secured to select raw material, to supervise the processes, to test the finished

product, to merchandise it. In fact the closest study of everything is made except of the most vital factor in the business—the men.

We are just beginning to recognize the importance of a knowledge of men, their impulses, desires, hopes, ambitions, and also of the necessity of their understanding us, and our impulses, desires, hopes, and ambitions as well as their own. They cannot understand us until they understand themselves. When Alexander Pope said "The proper study of mankind is man," he made a statement the importance of which we are just beginning to realize.

Every man is a salesman. He has ability to sell. He may sell ability direct to an employer. He may sell the goods his ability has produced, but he must sell and buy as long as he remains a part of any civilized community. "No man liveth to himself alone." Psychology will help one to discover his ability and enable him to market it to better advantage. It will help him to increase his knowledge and to make what he has worth more by teaching him how to use it. The ability to apply a knowledge of psychology to the handling of a group of men in industry, to organizing a selling force, to planning an advertising campaign, to the selection of men for office, for factory, or for the road is an ability that the world wants and stands ready to pay for as has been demonstrated over and over again.

This is a day when the search for values is engaging the attention of men everywhere. It engages the business man, and the scientist, as well as the expert in religion. The question of *use* is on everyone's tongue. What is the use? What is it good for? What can he do? The value of waste or by-products is an ever present one in every industry. There is an unrealized value in many of these by-products, which the

discovery of new processes or more efficient carrying out of an old one, will make available.

What is true of industry and industrial processes is true in a larger way of man himself. There is hardly one in ten who knows himself well enough to know what he can do best, or the circumstances under which he can do it. Scientists say that most of us use only from ten to thirty percent of our ability, not because we are lazy or indifferent but because we do not know how to apply our mental and physical powers.

Psychology helps men to understand themselves. Literally hundreds of men who have studied the subject in the last few years have discovered in themselves values and abilities they did not know existed. The results have been an enlarged vision, an increased economic value, often a new adjustment or a readjustment in industry or profession that has meant greater satisfaction in the day's work.

**Mental Mastery.**—Two ideas have been prominent in the past concerning man and the world. The older one was that man was to take the world as he found it and use it. It had been provided for him by someone. That Being had placed him here for a season. He was to make the best of the situation. He had been born into a system and was what he was because of that system. All his rights and privileges were his by inheritance. He did not know much about the world and he did not need to. By some process some knowledge had been obtained by those of influence which they were to use for the good of the common folk. This idea produced aristocracy and feudalism.

The newer idea which made its appearance with Galileo and which was clarified by Francis Bacon emphasized the fact that man was not bound by any system—that he need not accept the world as he found it. He could remake the world and exploit its resources for his own satisfaction. The world was

composed of raw material which he could make over into many things.

Under the old idea the world made very little progress. It discovered fire, invented the bow and arrow, made pottery, but it never learned to control power to any extent. It domesticated animals, used to a degree the winds and waves, invented some simple mechanical devices and, previous to the French Revolution had produced a low grade explosive, but these were the results of accident more than the results of diligent search for means to control power.

So rapidly has the idea of remaking and controlling the world progressed that since the overthrow of the Holy Roman empire twenty-six new sciences have arisen. There has been a marvelous extension of man's power of control in the physical realm. He has learned to control the power of steam, electricity, and chemical reactions, and to apply this power to transportation, communication, and industry.

In the biological realm he has used his increased knowledge and power to banish diseases. Bubonic plague, cholera, yellow fever, smallpox, malaria, sleeping sickness, and hookworm are no longer terrors to man. He has learned the secrets of control in the biological realm so that he has materially increased the food supply of the world thru plant and animal breeding. He is now actually making his world.

Just as man has come to recognize the necessity of control in the physical and biological, he is coming to recognize the necessity of control in the psychological and the sociological fields. He is already beginning to realize that in remaking the world he has remade himself—that in making laws for the control of society, in the development of social organizations, and in setting up governments he is making instincts, emotions, and ideas do for him what they have never done before.

The mind of man has grown from humble beginnings with-

out much attempt to see ahead. "Sufficient unto the day" has been his motto. It has reached a stage approaching adult vigor and is in a position to begin to direct its own course thru conscious control.

Just as surely as changes have occurred in the physical and biological realm as a result of man's endeavors, just so surely some changes have occurred in man. The changes which he has brought about with plants, animals, minerals, and metals have reacted favorably upon himself. He is approaching the time when *mental mastery* should be his goal.

Mental mastery, or self-control, can come about only thru self-knowledge, and it is to the field of psychology that we look for help. When I speak of knowing one's self, I mean the whole man, physically, physiologically, mentally, and morally. One cannot fall short of this and succeed supremely. What this course aims to do is to indicate the road, point the direction, describe the tools, and show how they are used.

**Relation of Mind and Body.**—The mind is related to the body as it is not to any other object. Perhaps we would be nearer right if we thot of the body and mind as two parts of the same unit rather than thinking of them as separate entities acting together. We do not know anything of the mind's activity except as it expresses itself thru the body. There are many speculations about the activity of the mind apart from the body, but no experience has been established which satisfies the scientists, one of whom is the psychologist, of such a fact. It is to the body that we must look for the expressions of mental activity.

**Bodily Activity.**—Whatever has been accomplished by the race, or by individuals has been done through bodily activity. One may dream of what he will do, but unless he acts—tells his plans to others, writes them, or carries them out himself—nothing will be accomplished. Unless men do more than think,

unless they plow and sow the seed, write the poems, build the bridges, launch the ships, harvest the crops, deliver the orations, preach the sermons, nothing results from the thinking except the exercise of the mind that did the thinking.

On the other hand, wherever we see railroads built, tunnels dug, schools established, monuments erected, books printed, we infer that someone has been thinking. Someone has dreamed and the dream has come true. The real dreamers bring the things to pass.

Forever they are dreamers,  
Who make their dreams come true.

—BLISS CARMAN, "Ode to Edward Seventh."

**Control of Bodily Activity.**—There has been much discussion in recent years in regard to the influence of mind over matter, and the question is not settled to the satisfaction of all yet, but in general, we may say that for all practical purposes, *all bodily activity is caused and controlled by the mind.*

When we speak of cause we mean a certain sequence, or order, in which things are arranged so that they always stand in the same order, never getting the cart before the horse. Finding things always occurring in such order, we say the first *causes* the second. Often we do not know enough about the conditions to be sure. A thing may be the occasion and not the ultimate cause; but if we find the events or phenomena appearing in the same order time after time we come to associate them as cause and effect. So often have we found that preceding action that when we find bodily action we postulate mental activity as its cause.

There are a number of reasons why we do this. Have you ever been hungry and have someone mention food, and then find your "mouth water"? Pawlow carried on many experiments with dogs, and discovered that if a picture of food was placed before the dog the salivary glands began at once to

secrete saliva. That is, the idea being aroused in the mind caused the salivary glands to act. Bodily action followed the mental activity. Any stimulus that will arouse the idea produces the same result.

We know how digestion is disturbed when we are sad. We do not desire food. A picture of food placed before us at such time does not result in salivary glandular activity, because the mind is too intent upon something else, yet the impressions from the picture were registered in the brain just the same as before. So it seems that unless the mind holds the proper idea orders will not be issued to the salivary glands. When one is frightened, the heart beats faster, breaths come short and quick, and a number of other bodily reactions occur, due (we quite naturally and properly infer) to the frightened condition.

**Ideas Tend to Express Themselves in Bodily Activity.**—We have stated that all action is caused and controlled by the mind. We want to go a step further and say that all ideas tend to express themselves in bodily activity. *Every idea seeks expression.* The only means the mind has for expression is thru the body. One idea may express itself, or tend to, thru external organic action by striking with the fist or by calling names with the tongue, or by wishing a friend “a merry Christmas.” Another idea may tend to express itself thru some internal bodily activity which may be chemical and not organic at all. You will notice that we have said “tend to express.” Often one is able partially to prevent the expression of an idea. He may be angry and yet not express in words what his tendency is. He has been told to count ten before he speaks when angry, so he does not speak. His anger has subsided before he finished counting. But even then he did not prevent entirely the expression. A change of countenance, quick breathing, and perhaps a turning away gave some ex-

pression. When a tendency to act or speak is suppressed, we say it is inhibited.

Remembering that every idea tends to express itself in bodily action, it is well for us to take heed as to what ideas we allow entrance to our minds. The saying, "As one thinketh, so is he" is virtually true; for one is bound to do the thing he continues to think of doing. He is quite sure to become the kind of man he continues to think of becoming. The universe is so organized that each one has within himself the power to become what he wills.

**The Body a Machine for Doing Work.**—The body is a machine for doing work, and no matter what our theories may be as to its ultimate relation to the mind, it serves the mind as an instrument of expression. If the best expression of the mind is to be attained, the body must be kept in such condition that it can function properly. One would hardly think of trying to drive a car without some careful attempts to understand the principles of its operation. Yet here is a machine vastly more complicated and delicate than an automobile and most of us take little or no pains to understand its mechanism. I suppose the reason is that it is made so nearly "fool proof" that it goes without much attention. When the car gets out of order we call up the garage and are "towed in." When the body gets out of order, we send for the physician, and sooner or later are "towed out."

Ordinary good sense would indicate a sufficient knowledge of the operations of the body to enable us to take proper care of it. This knowledge, if observed, will not only keep us in better health, and enable us to live longer, but will give us very much better service while we do live.

**The Cell Theory of Life.**—In order to have a good idea of the body and its functions, it will be necessary for us to take a brief survey of life and its development. The fact that life

begins with the egg was unknown to men of pre-scientific days. They thought life was due to the entering of a "life-principle" into the body and that death occurred when it departed. We know that life as we commonly conceive it begins with the egg and that death is due to the cessation of the process of oxidation in the body.

**The Living Cell the Basis of Life.**—About a generation or so ago, Schwann of Germany and Huxley of England established the theory that the living cell is the basis of all life, that each plant and animal, including man, begins as a single cell. The cell is able to live, breathe, feel, move, gather food, avoid danger, adapt itself to conditions, and pass its characteristics on to the next generation.

**The Amœba.**—The parts of a cell are the protoplasm and the nucleus. The nucleus and its network of tiny threadlike fibers are the only hint of a brain and nervous system the cell has. In the *amœba* (the simplest of the single-celled animals), any part may on the instant become an arm, a leg, a stomach, etc. Subsequent evolution adds no new function, but develops special structures to perform them. As these special structures develop, we shall find a distribution of duties somewhat along the line of division of labor in modern industry. This we shall consider later.

**The Amphioxus.**—For ages the single-celled animals were the only ones on earth; but thru the slightest variations, higher forms appeared, each composed of many cells instead of one, a sort of colony, or community. While this stage was being reached new plans were worked out for feeding, informing, scavenging, and protecting the colony. *Amphioxus* is the name given to one of the little animals. It stands a long way up the scale from the amœba, but is very much farther away from the highest of the class of which he was the forerunner, the vertebrates. He has a mouth and a stomach and the sim-

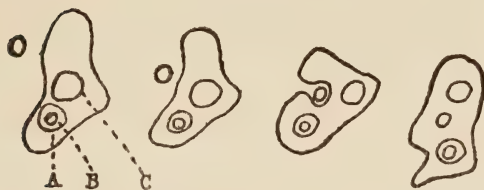


FIG. 1.—An amoeba is about  $\frac{1}{50}$  of an inch in diameter. These sketches show an amoeba getting its food and swallowing it. When it comes into contact with a particle of food-plant or animal, or a tiny piece of something else, it just begins to wrap itself around the particle until it is completely surrounded. Any indigestible matter passes on thru the body and out. The amoeba is a minute particle of protoplasm, and each little animal contains a nucleus A, and a nucleolus B, besides water spaces called vacuoles C.

plest form of a backbone ever discovered. There is a little cavity in the upper side of it in which a nerve tube rests. From

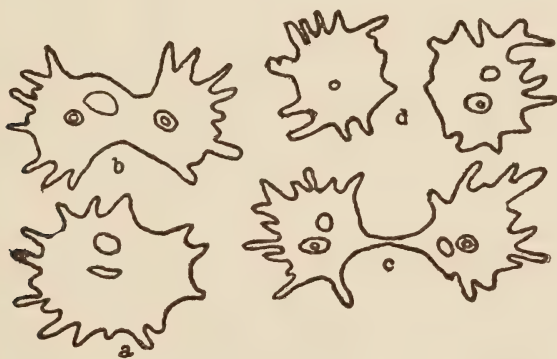


FIG. 2.—The amoeba, like all animals, grows until it gets so large that food enough cannot be absorbed to keep it increasing in size. Then it begins to divide as seen in Figure 2. The division takes place thru the nucleus which is the very center of life, whether it be in plant or animal cells, and when complete each part is a fully equipped amoeba and the process of growth and division continues indefinitely.

it there are sent out very slender nerve fibers to different parts of the body. It reproduces itself by laying a single egg which, when fertilized, develops as does the amoeba; but instead of

separating and parting company and each becoming a separate individual, the parts all hold together within the egg, and finally the young amphioxus comes out or, as we say, hatches. After hatching the cells all remain together, each group keeping its own place and doing its own work as part of the group. The function of each group of cells is determined while the creature is yet in the egg.

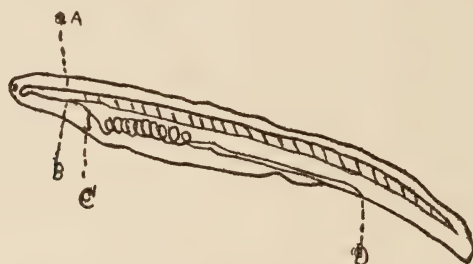


FIG. 3.—The amphioxus is about  $1\frac{1}{2}$  to 2 inches long and lives buried in the sand on the seashore. It is a hollow tube thru which water flows and from which food is caught as it passes. In the figure, A is the nerve tube, B the backbone, C the opening where the water flows in and D where it flows out. The amphioxus has no head or tail but does have a mouth, stomach, simple form of backbone, and a nerve tube.

If you take a hollow rubber ball and press one side in and cement the edges of the fold together, you will have a fairly good idea of how the amphioxus is made, for it is a hollow tube so folded that a part of the outside becomes the inside, and because it is the inside it has different work to do. Division of labor is established among the various groups of cells.

The *outer layer* of cells becomes the skin and nervous system. The *middle layer* becomes muscles, blood vessels, and egg-producing part of the machine. The *inside layer* becomes the stomach and other parts of the digestive apparatus. The nervous system co-ordinates the whole body so that its parts can act together when necessary.

**The Human Nervous System.**—There is an increase in complexity in the evolution of the nervous system from amphioxus to man. In the human embryo there is a hollow tube, modified and enlarged at the upper end. The nerve tissue thickens at the back or the dorsal side of the embryo and gradually folds over forming the tube. At the upper end three enlargements are formed by the unequal thickening of the walls of the tube. From these enlargements the brain develops by a series of outgrowths and foldings or crumplings. Along the spinal cord there appear little branches which develop into the spinal nerves and into the sympathetic nerves. In the human being there is a mutual relation between the brain and the spinal cord and a complete unity of nervous action.

Each human being begins as a single cell. The process of development continues until the body composed of billions of billions of cells is complete. In the human body instead of having only three groups of cells as the amphioxus has, we have some thirty different kinds, each doing its particular part to keep the body functioning properly. We have nerve cells, smooth muscle cells, hair cells, bone cells, blood cells, nail cells, skin cells, etc. Each cell is born, grows, performs all the functions of a single living being, reproduces itself and dies.

**Cellular Intelligence.**—The question arises at this point as to what keeps these different groups of cells, or any single cell, at work. We do not have to give attention to them all in order to have them do their work. We do not have to say to ourselves, Now it is time to breathe; now, to digest food; now, to secrete bile; now to make the hair grow. If we had to give attention to the smallest part of any of these functions, we would not be able to keep alive. However, we know these various activities are carried on from birth to death without our giving much, if any, thought to them. The question is, what makes the machine go?

It is what may be called "cellular intelligence." There is an intelligence, if we may use the term for any activity so low down in the scale of life, that takes charge of the processes of the cell in a multicellular body just as we saw is done in the case of the single-celled amoeba. Dr. Carrel of the Rockefeller Institute has demonstrated that living cells taken from a body, properly protected and fed, can be kept alive for long periods; not only that, but they grow. In 1912 he took some tissue from the heart of an embryo chick and placed it in a culture medium. It is living and growing yet. There is life in each organ, a "livingness" in each complete organism, so tenacious that a part of the organism may be removed and kept alive and growing while the remainder dies and goes to decay.

Single-celled animals never die a natural death and biologists are beginning to wonder if multicellular animals need to. The cells of a human lung can be made to live indefinitely when placed outside the human body where they are not compelled to cooperate with groups of cells in other organs. This specialized service, differentiation of function, or division of labor, whatever we may call it, sooner or later causes a break and eventually death. The break may come in the stomach group, or the liver group, and so on. The inability of any group of cells to function properly throws the whole body out of order and death results.

It has been discovered that X-rays of a certain intensity will kill weak cells and not injure the strong ones. If weak cells can be destroyed by X-rays or by radium before they can kill the whole body, life can be lengthened indefinitely. To bring this about is the problem biologists are now trying to solve.

Let us turn our attention again to the amoeba. We find that it requires all the power it has to perform its vital functions because every part of the little organism is engaged in

every activity. It has about all it can do to keep alive but, as the development of higher forms of life proceeds and the differentiation of function becomes more firmly established, an economy is effected whereby not quite all of the effort of every group is required all the time to keep the machine going. There are shortest possible periods of leisure in which, so to speak, the living animal has time to "think." It chooses more wisely in food selection and more accurately between friends and enemies, has time to make a trifle better adaptation to environment, and so makes possible a further and higher plane of life. Some of those activities to which it was in its lower stages obliged to give all of its attention have now been given over to habits and later become so ingrained in the very structure and life of the cells that we call them instincts. They have become so essential that life cannot be preserved without them.

We all recognize that the thing to which we must give our entire conscious attention today may become in a few months such a well established habit that we perform the act without any more thought than to decide to begin the process. May we not also assume that, if that habit makes only the minutest change in a nerve center and if the same habit becomes established in our children with the same minute changes that in the long ages of unfolding the basis of that action may be shifted from habit to instinct? Of course we do not know enough about our ancestors to be sure what they were. No one knows enough about the mental characteristics of an ancestor of ten generations ago and of the intermediary generations to determine just what particular changes have been made in the successive nervous systems including his own body, but ten generations are as nothing in the processes of the ages. Certainly changes in the nervous systems of the animal kingdom have been made, and so far as evidence goes every modification has come through influences at work within the organism influenced by its

environment and not by injecting of another force from the outside.

These changes in the nervous organism have resulted in an increased efficiency and in a larger leisure. Division of labor among the groups of cells has resulted as a division of labor in industry has. Man has time consciously to direct his

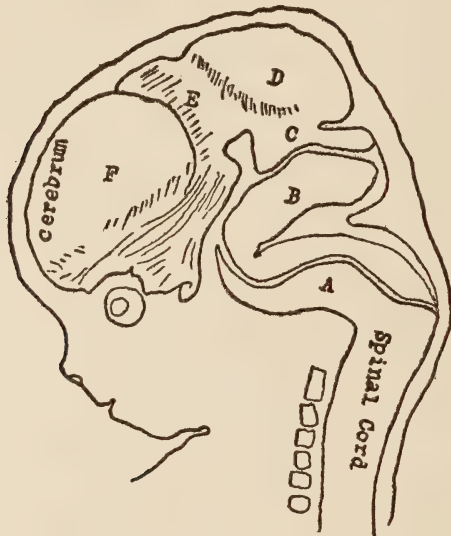


FIG. 4.—A human embryo of six weeks growth showing the spinal cord and its outgrowth in skull. Notice how A, B, C, D, E, and F are folded or crumpled back upon the upper end of the spinal cord.

efforts. He can make plans for future activity. He can set goals to be attained. He has time to weigh the results of efforts of other men and of his own. Where formerly he could see as far ahead as the next day, now he sees ahead weeks and months and years. This has enabled him to become conscious of innumerable things of which his earlier ancestors were entirely ignorant. Psychology should help us to under-

stand ourselves so we may employ wisely this larger consciousness.

**The Cerebrospinal System.**—We must understand the nervous mechanism a little better because it plays such a large part in life. The human nervous system is composed of the cerebrospinal nervous system and the sympathetic nervous system. The cerebrospinal system is composed of the *central nervous system* and the *peripheral nervous system*. The central system consists of the brain and the spinal cord which runs two-thirds of the way down the spinal column. The peripheral system extends to the surface of the body, to the special senses, and to the muscles.

**The Brain.**—All the power one exerts is thru his nervous system. Each one of us is protected and kept alive thru its functions. We are made aware of the need of food, we are informed of a headache, we are warned of fire, we are told about cold feet and of toothache, in fact we are kept fully posted about all of these and many other things that are essential to our health and safety by a properly functioning nervous system. We might starve, freeze, or be run over by an automobile were it not for these continual advices which we receive. The *brain* is the most important part of the entire system because by means of it we come to understand what these various messages mean. It makes possible the interpretation of nerve language. It will be necessary for us to get a little more familiar with this important part of the system.

The average weight of the brain at birth is twelve ounces. The average weight in adulthood is three pounds. From birth to adulthood the brain not only increases in size but increases in complexity. The growth in complexity of structure is really more important than the increase in size. At birth there are about ten billion cells in the brain and the number in any one brain never increases altho, through disease and injuries, the

number may be decreased. While the number of cells is not increased, the size of the cells is. The increase in the size of the cells depends somewhat on what we ask them to do for us. I suppose many of us never call all of the cells of our brain into activity and so never realize to the full our capacity either to work or to think.

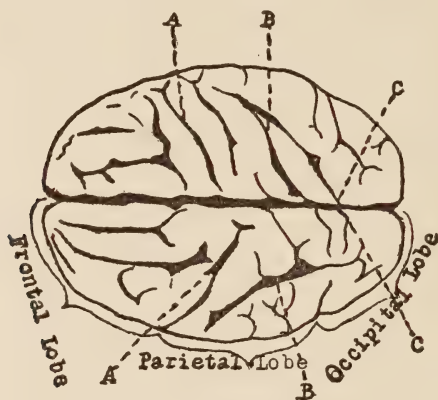


FIG. 5 shows the upper surface of the cerebrum, indicating the location of the more prominent fissures. The fissure of Rolando is indicated by A, the fissure of Sylvius by B, and the parietal occipital fissure by C. It also indicates the lobes of the cerebrum.

The brain is composed of the *cerebrum* and the *cerebellum*. The *cerebellum* is the lower part of the brain. It is the organ of equilibrium and of motion. It receives the sensory impulses from the skin, the muscles, joints, and semi-circular canals of the ear and from the eye. The impulses from the cerebellum help to maintain the right degree of muscular tension. So far as is known the cerebellum has nothing to do with consciousness and operates independently of it.

The *cerebrum* is the upper part of the brain and in the adult nearly covers the cerebellum. It is in reality the thinking cap. It is divided into two nearly equal parts somewhat resembling

the meat of an English walnut. The cerebrum grows faster than the skull and so forms folds and wrinkles on its surface which are called convolutions. Between these folds are spaces which are called fissures. The mind grows as the brain grows and cannot grow any faster. In all cases where the brain does not develop to normal, the intelligence of the individual is below normal, ranging anywhere from that of an idiot to that of a high grade moron. We often hear the expression, "He hasn't any brains," when what is really meant is that he does not use what he has, but in many cases he does not have any brains, or at least not good ones. One cannot use what he does not have.

In appearance the brain is quite the color of a piece of putty. It is covered with a layer of gray matter not over an eighth of an inch thick. This covering of gray matter is a very essential part of the brain as we shall see.

Thru studying diseases and by examining persons who have been injured scientists have come to know that certain functions of the brain are located in certain definite parts, because any injury or disease of that part interferes with the function and may prevent it entirely.

The *lower part* of the cerebrum is the seat of control for certain vital functions, such as breathing, heart-beat, secreting saliva, swallowing, etc. These are in a sense involuntary as they can be performed without consciousness.

The *middle part* of the cerebrum is quite a large region and is the seat of control of voluntary movements. It is the function of the middle part of the cerebrum to respond to auditory and visual reflexes. Sensory impulses from the retina of the eye and from the cochlea of the ear enter here into synaptic connections with muscle-nerves of the face, eyes, and other parts of the body.

The *fore part* of the brain is the seat of the perceptive,

reflective, and interpretative powers of the mind as indicated by Mills and others. That is, they place the seat of the higher powers of the mind in the fore part of the cerebrum.

The outer layer of the cerebrum and of the cerebellum is called the *cortex*, which means bark. It is the gray covering just referred to. The cortex of the cerebrum is much more highly differentiated as to functions than that of the cere-

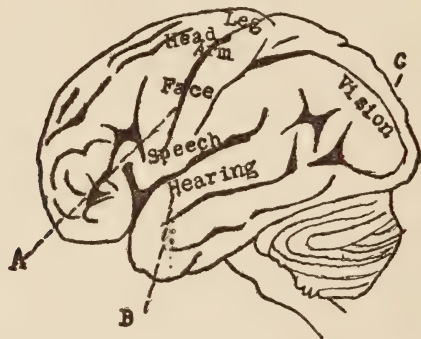


FIG. 6 presents left side view of the left hemisphere of the cerebrum, and indicates the localization of functions in the brain areas, or centers.

bellum. In the cortex of the cerebrum are various centers or areas, such as visual, auditory, frontal association, olfactory, etc.; that is, only one kind of impulse gets to the same center, or area. The nerve processes of the cerebral cortex are directly associated with consciousness.

**Association Centers.**—There are large areas in the brain that do not serve any sensory or motor function, but serve only to connect sensory and motor centers. They form association tracts which bind together all parts of the brain. Mental ability depends rather upon the power of association than upon the size of the brain.

**The Thalamus.**—There is a large mass of nerve fibers lying in the center of the brain called the *thalamus*. All sensory impulses except those from the olfactory membrane pass thru the thalamus before reaching the cerebral cortex. These impulses undergo some modification which results probably in their establishing a closer association with other incoming impulses so that there is more or less correlation before the nerve energy reaches the cortex.

**The Medulla.**—The medulla is between the spinal cord and the cerebellum and is about an inch long. It is a sort of gateway between the brain and the body. All sensory impulses from the trunk to the brain and all from the brain to the trunk pass thru the medulla. Here are found the nerve centers that control circulation and respiration.

**The Spine and Spinal Cord.**—The spinal column is composed of thirty-one irregular bones placed one above another, each called a vertebra. There is a round hole in each side of each bone, sixty-two in all. Out thru each hole passes a nerve about as large as a goose quill. Each is called a spinal nerve because it comes from the spinal cord. Each nerve has two roots; one is smooth and the other has a little nodule, or ganglion, somewhat similar to the little nodules found on clover roots. Each nerve has a sort of insulation so that the impulses cannot be lost or dissipated; then both are wrapped together much as we wrap two electric wires together. Every message going to the brain passes thru the root with the ganglion in it, and every one going out passes thru the smooth root. The *spinal cord* is the main highway of all travel for all impulses between the brain and the body.

Each of these spinal nerves continues to subdivide into from two hundred to twelve hundred fibers, often passing out of the wrappings of one bundle into the wrappings of another.

Before considering the function of the spinal cord, let us

consider the neuron or nerve cell. The neuron is composed of four parts: (1) Cell-body; (2) Dendrite; (3) Axon; (4) End-brush.

Let us remember that in the nervous system *gray* color means nerve *cells* and *white* means nerve *fibers*. The vital part of each neuron is the cell-body. Its special function is to conduct the energy called neurokyme which the neuron generates. Another function is probably the nutrition of the neuron.



Fig. 7 is a sketch of a neuron showing the different parts. Energy flows from dendrite to end brush.

Dendrite (from dendron, Greek for tree) is the name given to a part of the neuron because of its branching. It conducts the impulse toward the cell-body.

The axon is to the neuron what the wire is to the telephone system. It transmits or conducts the nerve impulses away from the cell-body. There is usually only one axon to a neuron. Each dendrite and each axon

is covered with a medullary sheath. Many scientists claim that the neurons in the cerebrospinal and in the sympathetic systems do not function until the medullary sheath has been produced. This may account for the late functioning of some of these neurons. The child has few medullated neurons when born, but they develop so rapidly that in a few weeks or months certain fundamental tracts are functioning regularly. The medullary sheath is a fatty substance produced by the neurons and serves as a sort of insulation. The axons covered with it make the white portions of the spinal cord and brain. The axons of the sympathetic system are not covered with it and so are gray in color.

The end-brush of the neuron intertwines with the dendrites

of another neuron yet does not come into actual contact with them. The end-brush may end in a muscle or in a gland. In the first case muscular action results, in the second chemical action results. The neurons which connect sensory with motor neurons are called connectors. The brain is composed largely of connector neurons and as a result there are millions of *synapses* in the brain. These gaps tend to retard the speed of the impulse and so delay action.

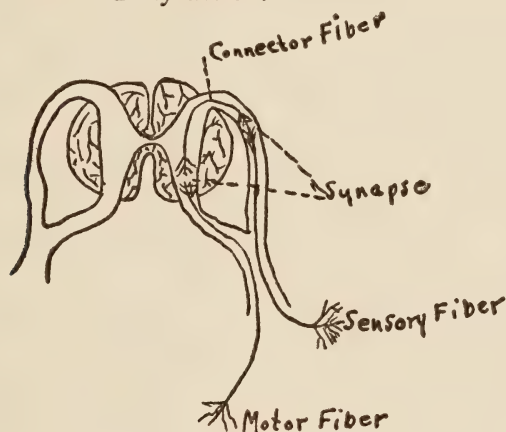


FIG. 8.—Reflex arc.

The dendrites are microscopic and the axons are microscopic in diameter, altho not in length. Many of them are several feet long. One reaches from the top of the head to the small of the back.

The cell-bodies are also microscopic, measuring from 1-160 to 1-6000 of an inch in diameter. The cell-body contains neurofibrils which extend into the axons and serve to help conduct impulses. It also contains chromatin, a substance concerned in the metabolic processes of the neuron. Overwork breaks down the chromatin. These metabolic changes in the cell-body (which may be chemical) may be the cause of certain nerve impulses.

The ten billions of neurons of the brain are divided into groups, each performing its own work. Each group responds only to a particular stimuli, just as axons conduct only one kind of message. One group of these neurons responds to impressions which we interpret as sight; another as hearing; another as touching, etc. Each of these groups has to do with only one set of impulses. It is important to recognize, too, that each group depends upon stimulation for its development. If for any reason the end nerves leading to one of these groups is destroyed not only is the ability of the nerve to function lacking but the neurons of the group never develop.

**The Function of the Spinal Cord.**—The spinal cord has two functions; one, to convert sensory impulses directly into motor impulses, without the necessity of consulting the cerebral cortex about the matter; another to transmit impulses to higher or lower levels of the nervous system.

We must remember that when these nerves subdivide into hundreds of fibers the ends, while never actually meeting each other, are in the same field and so near that messages may pass from one to the other as influence passes from magnet to metal in an electrical field. These gaps as we have already indicated are called by the psychologist *synapses*. These contacts are purely functional and not anatomical. There is no actual contact of the nerve fibers. There may be several fibers within the field and each fiber and synapse may be regarded as offering a greater or less resistance to the flow of the energy or neurokyme. Here, as we might expect, the line of least resistance is taken, and having once been selected, it is very likely to be selected the next time; and so thru repetition a sort of thru connection is established. Altho each neuron has possible connections with many others, it is possible to get a "thru line." Habit is formed by getting a "thru line" so often that the connection becomes almost, if not quite, automatic.

**The Reflex Arc.**—The reflex arc is the functional unit as the neuron is the structural unit of the nervous system. In its simplest form the reflex arc consists of a stimulation affecting the sensory nerve which leads to the sensory ganglion in the spinal cord, then thru the spinal cord to the motor ganglion and then out thru a motor nerve to a muscle. Sometimes there are a number of neurons between the first and last. These intermediate neurons are called connector or *association neurons*.

**The Sympathetic Nervous System.**—The sympathetic nervous system is composed of a chain of ganglia lying outside of the spinal cord. The chain is composed of forty-nine ganglia—twenty-four on the right side of the spine, twenty-four on the left, and one in front of the lowest bone of the spine. Each ganglion is connected with its neighbor above and below by a rope of axons which hangs in a loop from the upper end of the spine.

The neurons of the different ganglia send off axons to definite parts of the body—heart, stomach, liver, etc. At these different centers, the axons are closely interwoven, forming a network called a *plexus*. A number of small ganglia are interwoven with each plexus. These plexuses all lie within the body cavity and are in close connection with the organ which the plexus controls. There are a number of smaller ganglia scattered thruout the organism, in the eye-socket, in the thoracic cavity, on the walls of the heart, etc.

The sympathetic system extends to all organs of the abdominal cavity, and to all involuntary muscles. The cerebro-spinal system is connected with the sympathetic system thru

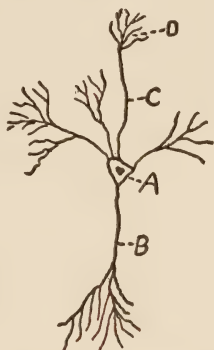


Fig. 9 is a sketch of a neuron from the cortex of the cerebrum showing cell-body A, axon C, dendrite B, and end-brush D.

the spinal nerves, each of which sends two branches to a ganglion, one carrying outgoing messages and one incoming messages. There is no other known connection between the two systems.

The sympathetic system controls the action of the glands, the smooth muscles, peristaltic motion of the stomach and intestines, the tension of the arteries, and all the vital functions of the body without our being conscious of their operation. However, when things go wrong and the stomach does not function properly, or when we have taken ptomaine poison into the system and something needs to be done about it, impulses are sent from the stomach to the sympathetic ganglia, then into the spinal cord and thence to the brain, arousing consciousness. Then, we send for the physician.

We cannot control the sympathetic system directly, but we can influence it thru its connection with the cerebro-spinal system, a part of which, the brain, is very closely associated with consciousness.

Mosso of the university of Turin determined that the seat of the emotions is in the sympathetic nervous system. So we see why we do not want food when we are sad and why we have a hard time digesting if we do eat it. Anything that disturbs the emotions interferes with digestion. Joy and happiness help it; sadness and sorrow hinder it.

The sympathetic system is controlled by the mind calling up the neurons of a central station and making some demand upon them. The neurons respond by setting the muscles to work. The muscles call for blood, and the ganglia of the heart and the blood vessels are compelled to go to work. Certain neurons, as we have seen, control others, which accounts for the unconscious service that we sometimes get. The reason the mouth waters when we are hungry and think of food

is that the neurons of the brain issue orders to the salivary glands and they immediately respond by producing saliva. The mere suggestion is sufficient to secure action. The power of suggestion to control the functional activities of the body will be considered more fully later.

**Consciousness** is a characteristic of mental facts by which we become *aware* of them. "Mental facts are phenomena that can be known to one person only and that one the person experiencing them." Consciousness means endless change, or discrimination. The word means knowing *with* or *together*. Consciousness indicates mental change, and mental change indicates bodily change. Whether consciousness is the cause of the bodily change or vice versa scientists are not all agreed. However, so far as we know there is no consciousness without the action of the cortical cells, but whether all action of the cortical cells causes consciousness we do not know. It is the commonly accepted opinion that consciousness is a cause rather than an effect; that while the impulses that run thru the nerves and ganglions are physical phenomena, the result of these is something quite different.

Those who are inclined to place more emphasis upon the psychological processes as the cause of consciousness, point out that reflex action is without consciousness, because there are very few neurons involved, that when an inconceivably larger number of the neurons of the cortex are stimulated, the reaction is of sufficient force to *arouse* consciousness, or to *cause* consciousness—that is, that when the cortical cells are involved we get consciousness, otherwise not.

We do not know just when consciousness begins in the individual, and none of us can remember when it began in his own life. Judging from experiences with children, consciousness appears soon after birth and continues to increase in scope and power until maturity, which probably occurs at about

the time of man's highest mental efficiency. The fact that the neurons of the cortex are the latest to develop and that consciousness cannot develop without neuron reaction accounts for the comparatively late appearance of consciousness in the race.

The insect, animal, or human that can respond to the greatest number of impulses, enjoys the highest degree of consciousness and of intelligence. The impulses received and responded to by the caterpillar, the dog, the Australian Bushman, and the Anglo-Saxon indicate the degree of consciousness each possesses. Accidents to the nervous system modify or completely destroy consciousness. Diseases and drugs may have similar effects.

As to the relation of consciousness to the nervous system, it is possible that a stimulus in the cortex may simply open the way for consciousness to appear, as turning the faucet lets the water run. The faucet does not *cause* the water to run, altho it cannot run without the faucet being turned. Again, it is well to remember that for all practical purposes the body is a machine which the mind uses.

The mind is often thot of as synonymous with consciousness, but that is not in accordance with common experience. There are many activities of the mind carried on without consciousness. Impressions made upon the neurons of the nervous system are retained and interpretations of those impressions are retained. Associations are, as we shall see later, formed and strengthened without consciousness. All past experiences remain a part of the contents of the mind, altho not always in consciousness. It is as tho the mind were a great reservoir into which the elements of experience, after more or less sorting, are poured to be retained until needed for further use.

There has been a good deal of confusion in regard to distinguishing between these different phases of the mental activity. Some have spoken of the *conscious* mind, the *sub-*

*conscious* and the *unconscious* mind, thereby seeming to indicate that we have two or more minds. We want to make it perfectly clear that there is only one mind, however many forms of manifestation it may have. It seems much more satisfactory, and also in accord with the facts, if we speak of the *consciousness*, the *subconsciousness*, and the *unconsciousness*, remembering that they are contemporaneous in time but with no "visible" connection. Yet, there is always a *unit* of consciousness. It relates to *me*. *I* am the one who is conscious. It is *I* who had that experience ten years ago and it is *I*, the same *I*, that remembers having had it. In spite of all the changes of the years, the sleep of nights, the delirium of disease, the continual wearing out and rebuilding of my body, including the neurons of the brain, *I* still remain. Thru all these years there has been a broadening and deepening of consciousness which has resulted in establishing an increasing number of contacts with men and things. This consciousness is *mine*. It is a unity, yet made up of vast numbers of little experiences as the motion picture film which seems to run on as one continuous picture is composed of a great number of separate pictures. I am not my body. I am more than that. I live in my body and use it, but I am superior to the house in which I live even tho I have great regard for it and give it the best of care.

There is a quality of "livingness" that indicates where a living thing stands in the scale of development. The plant, fish, dog, boy, are equally alive, but there is a difference in the quality of "livingness" each possesses. "Livingness" of an individual is the measure of its consciousness and of its intelligence. In man, because of the delicate machine in his control and because of his ability to direct it, his consciousness has outrun that of all other creatures and it is still running. The continuous enlarging of consciousness is our task.

## CHAPTER II

### SENSE-PERCEPTIVE PROCESSES

WE live in a world of continuous change. Nothing is at rest. The scientist tells us that even the electrons are in continuous revolution around the center of their little system. In fact, change is the only permanent thing we know.

With many of these changes we are more or less acquainted but many of them most of us know about only by hearsay. The physiologist tells us that we have an entirely new body every seven years. We hope he tells the truth for some of us need it. We know that stains on our hands and cuts on our faces soon disappear and there is no good reason why we should not believe the physiologist, especially as he has nothing to gain by deceiving us. Neither have the other scientists for that matter.

We are concerned in this chapter with the method by which we get acquainted with these changes and to discover the manner in which we attach meanings to these changes, both those that are in the world outside of ourselves and those within, both of which have a bearing upon our mental development.

We saw in the last chapter that the body is equipped with a nervous mechanism by means of which the activities of the body are co-ordinated and by means of which the entire surface of the body is put into communication with the brain. Any disturbance in the way of stimuli at the outer end of the sensory nerves is instantly reported to the neuron to which the sensory nerve is attached and from there the disturbance may

be reported to a muscle or to another neuron and so on until the stimulus reaches the brain.

**World of Waves.**—Movements of bodies set air in motion in the form of waves which go in all directions until they strike some object. Then they are deflected and go on until the energy is dissipated. We live in a world of waves, some of which are continually striking against the surface of the body. Some of these waves arouse the nerves to action and some do not. Some of the waves are able to secure a response when they strike a certain part of the body but not when they strike anywhere else. Waves of air strike the auditory nerve and secure a response but the same form of wave striking the skin of the face or the eye does not arouse nerve action. Of course, sometimes as when there is a great explosion enough air is set in motion and with such force and rapidity that it knocks one down. He hears it too but it is not the sound that knocks him down. Of course waves in the air may come with force enough to arouse nerve action in the eyes and cause them to become red and inflamed but the response is not like the response given by the auditory nerve stimulation.

**Differentiation of Function.**—Thru the long ages of human evolution a differentiation of function has developed among the nerves so that one group attends to one form of stimulation, another to another, etc. These groups are better trained than some people are for each attends strictly to its own business and leaves the others to do the same. There are a number of these groups, five or more of which give us information about the external world. In fact, all we know of the world around us we know because of the activity of these nerves. They are the nerves of the special senses, the names of some of which we learned when children in school.

**Sensation.**—The capacity for sensation lies at the foundation of all knowledge. So the condition of the nervous system

is an essential factor in determining the kind of report that is made to the cortex. Good health is an important factor in accurate reporting. Sensation is not a physiological process as considered in this connection, but SENSATION is a mental interpretation of the cause of the disturbance of the nerves of the special senses.

Sensations are not knowledge any more than cotton is cloth. They are the raw material out of which knowledge may be built. They are the bricks out of which the house of knowledge is to be erected. These stimuli come to us without effort and may be recorded in the neurons without awakening any mental reaction or not enough to arouse consciousness because we have little or no interest in them at the time.

The clock strikes tho we do not hear it but the vibrations reach the ear and are recorded. One may be sound asleep and not know when the clock strikes, and yet, make a quick movement every time it strikes. The recording of stimuli has a bearing upon the idea we have of getting used to noises. New comers to the city are very much disturbed and quite worn out at first by the confusion of noises. After a few weeks they forget all about the noises and go about their work or study without paying any attention to them. The recording of the stimuli has gone on just the same but the persons have lost interest in them.

Many things of which we have never been conscious are recorded in the neurons of the brain and many of which we have been conscious and have forgotten are still registered there ready to be recalled when the proper association occurs.

While sensations are the raw material out of which ideas are made, they of themselves are not of so much importance as are the reasons why we attend to them. One sees what his friends see. All things are judged in relation to other things. We see what our past experience has established an interest

in. Yet everything we meet has some significance and makes some impression upon the senses.

**Using Senses.**—One should use his senses in order to improve them, for without use they cannot improve any more than the muscles can. Training the senses makes them more proficient. They respond to a larger number as well as to a wider range of impressions. The threshold of the senses can be lowered considerably thru use. Thru practice one can hear lower sounds than before. When one recalls that all the material he has for **making** ideas come to him thru the senses, he will realize that his first task is to increase his stock of sense material, or **SENSATIONS** and that thereby he grows to larger mental proportions.

**Perception.**—When two or more impressions have been registered together in the cortex and have been interpreted as sensations there is a tendency, whenever one of them is aroused in consciousness, for the mind to recall the others. When these sensations are so related that one of them recalls the others of the group into consciousness a **PERCEPT** is formed. **PERCEPTION** is the mental process by means of which we select such sensations as we wish to make the basis of our conscious life. Perception enriches a sensation by adding to it all of the remembered past. It is the recognition of the cause of the sensation. If I am aroused by a stimulus but do not know its cause I have a sensation. When I have identified the cause I have a percept and have performed the act called perception. Perception means that one is conscious of something. The value of that thing to his mental life depends upon how much or how rich a past he can relate to it. Groups of people are often tested by mentioning a word to them and having each one name what came into his mind immediately after the word was spoken. Of course everyone will immediately associate the idea with some experience of his past. Then have

each one make a note of the second thing that occurs to him, the third, etc., until he has written a list of ten things which have occurred to him one after another. In each one's list you will have a pretty good idea of how much his past experience can contribute to his present. I have often used the word *boat* as the first word, and have found that those who have always lived inland have a very different group of things to recall than have those who have lived near the sea, or the Great Lakes. The one group of persons cannot add very much to the idea from the past while the other group can add many things.

I recall a story of a teacher in southern California trying to teach Whittier's "Snow Bound" to a class of children but she had a very difficult time to interest them in the poem because only one of them had ever seen a flake of snow, and she had never seen more than a light flurry of snow herself.

Think what memories of the past would arise in the mind of each when the word *home* was mentioned to a group of persons among whom was one living on Fifth Avenue, one from a little farm in the middle west, another from Zululand, and still another whose parents died before he was two and a half years old and who for the next eight years had his only home in doorways around Chatham Square and later under the western approach to Brooklyn Bridge.

As someone has said there is no accounting for tastes. Of course there isn't unless you know the experience of the one whose taste is under consideration. As an Englishman said, "I don't like spinach and I'm glad I don't. For if I liked it I would eat it and I can't bear it."

Every new sensation should be closely scrutinized in order to determine whether or not it can be related to some group already in the mind. If it cannot, it is put into a class by itself to

be called up for comparison with later stimuli. This sorting process goes on continuously.

**No Dealing with Outside Realities.**—Perception does not deal with outside realities, but with the impressions of outside realities which have reached the cortex thru nerve stimuli. Perception interprets these impressions. If we do not receive appeals from nature, music, graphic arts, etc., it is because our senses thru which we come to appreciate these have for some reason not become active. If one's perception is indistinct he tries to clarify it by gaining more raw material thru the senses. If he cannot see distinctly he goes nearer, or gets a pair of tortoise shell glasses. The tortoise shell makes him look better and the glasses make him see better.

**What One Can Know.**—What one can know depends largely upon his environment which reacts upon his nervous system and which he will interpret in terms of his past experience. The fusion of the new element with those derived from past experience constitutes one's idea of a thing. We tie up our ideas in bundles and label them *ideas*. In perception we relate the experience to an object which is the thing that logically accounts for the perception.

**Interpreting Impressions.**—Whether the external object resembles our idea of it is difficult to tell. It depends upon whether our senses have reported matters correctly and whether or not we have interpreted the reports rightly. The fact that perception has its origin indirectly in observational material makes it evident that it can give us knowledge of qualities of material objects only. It will give us impressions of color, form, weight, size, shape, etc. But when we try to interpret impressions made upon the optic nerve as sight we must remember that it is the image upon the retina that perception deals with and not the external object itself. Do we know then that the object resembles the impression made upon the

retina of the eye? Assuming that it does, are we safe in assuming that an object resembles any or all of the impressions made upon the senses? Do we get a correct idea of the sun by the interpretation of the effect which its rays produce upon the back of the hand, or by the effect of its rays upon the uncovered eye? Is the sun like either, neither, or both? Is mustard as it tastes on meat or as it feels when you have mustard drafts on your feet, or a plaster of it on your chest? Do our senses give us any degree of certainty about the external world?

**Sense Deception.**—Before we attempt to answer this question, let us consider some instances where we know the senses deceive us. That things are not always what they seem is a common saying and “worthy of all acceptance.” We have often noticed in the “movies” that carriage wheels often appear to turn backward while the carriage goes forward. We know they do not. Little squares of gray paper laid on green paper look greenish, but they are not. There are many such peculiar appearances which the psychologist calls illusions.

The fact is taken advantage of by advertising men and merchants to quite a large degree. They know that plaids make things look larger. So they often put up candy and other foods in boxes covered with plaid designs to make you think you are getting more for your money. Large fleshy women of good taste and a knowledge of style never wear plaid dresses or plaid suits. They look large enough already. Tall thin women of the same social group never wear stripes, because stripes exaggerate height. The advertising man always places the “cut” of a cigar vertically on the page because it looks longer, but it isn’t. It reminds me of the question, Why married men live longer? The answer is, They don’t; it only *seems* longer. I suppose this is one of the illusions of the unmarried men.

You sit in a train which is standing still. There is another train standing still on the next track and opposite you. Presently one of them begins without jerk or fuss to move. You think your train is moving, and then you begin to have doubts about it. You are not sure whether your train is going ahead, or the other one backing up, or whether yours is backing up and the other going ahead, or whether both are going ahead, or both backing up, one faster than the other. You will have to look at some other object than the two trains to satisfy yourself. All the other passengers are in the same "boat" you are.

You have noticed often that when the rain is coming straight down that it strikes the car window as tho it came at an angle from the direction the train is moving and the faster the train goes the more nearly horizontal the rain comes. Yet, it doesn't, it only seems to.

I sat at my desk one bright afternoon. There was no sign of rain. Suddenly I heard a rumble of thunder. I was surprised. Feeling that a sudden storm was approaching I went to the door to see in what direction it was. As I stepped out on the veranda a horse and wagon went past. Then I knew what caused the thunder. It was George Miller's wagon. It had just crossed the Cayuga Creek bridge. My senses tried to play me a trick, but I caught them at it before they caused me much inconvenience. Do we always catch them at it? May they not sometimes deceive us so completely that we never discover it? If they deceive us at all how can we ever depend upon them?

**Trust Your Senses.**—We must in spite of all these illusions trust our senses. They are all we have to trust as a means of getting information about our world. We may speculate about their unreliability, yet we are forced to trust the

evidences of our own senses at least when they agree with those of others like ourselves.

**Cause of Illusions.**—Let us consider the cause of these illusions. It may help us some in restoring confidence in our senses. When a stimulus passes thru a nerve to the cortex the neurofibrils are thot to extend themselves as a result of the impetus. These little extensions are called amoeboid processes. The neuron which has been aroused into activity by a stimulus never quite resumes its former condition. It retains some of the effects of the change and later impressions will find the path more or less distinctly marked out. There is a tendency for the new stimulus to follow out the already tho faintly established *neuron pattern*. Often the stimulus overflows the neuron pattern and is dissipated, leaving only very indistinct traces in the cortex. However, if two sets of stimuli disturb the sensorium at the same time, one, we will say, disturbing the optic nerve and the other disturbing the auditory nerve, the amoeboid processes may extend far enough to prevent partially a general dissipation of the nerve energy by forming a short and easy connection between the two sets of neurons which have been excited, allowing an increased amount of energy to flow thru. A more or less composite, or perhaps we had better say compound, pattern is now set up and when later a stimulus excites either the optic or the auditory nerve, the entire pattern is aroused to activity. In this way the two are so closely associated that when one is present in consciousness the other is recalled.

**Common Factors.**—As the number of associated groups increase there is bound to be one or more factors common to several neuron patterns so it is not easy to tell just which one will appear in consciousness when stimulation occurs. Think, for instance, of the color red. It is associated with several patterns or groups of patterns, as red apple, red book, red hat,

red cow, the "reds," etc. Just which of these will appear in mind when the percept red has the attention depends upon several factors which we shall consider later. If it is associated with any of these objects the interpretation will be correct. There is nothing wrong in thinking of any of the above named objects in connection with the color red, but often we associate the sensory element with the wrong group. A loose shingle is interpreted as a ghost. In the case of the wagon going over the Cayuga Creek bridge the element *rumble* was put into the group of sensations which meant *thunder* instead of into the group which meant *wagon-crossing-bridge*. The sense stimulus was true but it was interpreted wrongly. ILLUSION is getting a part into the wrong whole, a sensory element into the wrong neuron pattern. In that case the sensory element is not what it appears to be. One must always be on guard against making the wrong interpretations.

How is one to determine that his interpretations are not illusions? I hear a sound and think it is a bass drum. I am trying to interpret it. My companion hears the same sound. He says it is a big gun. When I associate the sound with a bass drum it seemed about a block away, but when I think of it as a big gun, I think of it as fifteen or twenty miles away. I am checking up my interpretation with that of my companion and we do not agree. We refer the matter to the first man we meet and he agrees with my companion. In the meantime we have walked to about the place where I thot the bass drum would be if my interpretation was correct but we neither see nor hear any signs of the drum. Then I come to the conclusion that my companion was right in his view of the matter. We decide it was the big gun and not the big drum which we heard. Our interpretation determined the object to which we referred our impressions and on comparing experiences we came to an agreement.

**Objective and Subjective.**—Only those interpretations which may become common property are called objective. Those which cannot become common are called subjective. To every form of experience there is a proper test and we should seek to find it and apply it to our experience. For the great majority of us there is an approximation toward agreement. The validity of one's perception rests on the fact that his agrees with that of others. If it does not agree he ought to check his interpretation very carefully. It may be that one of the senses is defective. He may be color blind, does not hear correctly, or he may have an astigmatism which prevents him from having transmitted to the cortex the same stimuli that others have.

**What *Red* Means.**—Of course you cannot know what I mean when I speak of red. All you know is that we call the same thing red but as to just what it means to me you cannot know because you cannot receive the same waves that I have received. You cannot know how long a yard stick is to me. Its length to you depends upon the convexity of the lenses in your eyes. If the yard stick looks twice as long to you as it does to me everything else will look twice as large and you and I would never know the difference. We judge everything by everything else. My idea of red is gained from what everyone else calls red. We judge motion by comparing the moving object with another that is not moving, but when we try to judge motion or direction in the large it is difficult because we have nothing to check with. It is pretty difficult to tell the exact direction and speed a man is traveling who is walking east on a train going west at sixty miles an hour while the earth is turning east on its axis at the rate of 1000 miles an hour, and at the same time moving in its orbit around the sun at the rate of 70,000 miles an hour while the whole solar sys-

tem is moving off thru space toward the constellation Hercules.

**Misunderstandings.**—Misunderstandings and misinterpretations arise because we do not check far enough back in our experiences. We too often take coincidents for causes just as we take one element of a neuron pattern for the whole pattern. The Egyptians observed that when Sirius, the Dog Star, appeared on the eastern horizon with the rising sun the Nile river began its overflow. They assumed that the star was the cause of the overflow. The translators of the Bible in dealing with the story of Elijah made the selection say that the ravens fed Elijah. Hebrew scholars tell us that the consonants, which were the only letters written in the old Hebrew, are the same in the words *ravens* and *Arabians* and that the translators put the part, the consonants, into the wrong whole and interpreted it as *ravens* when they should have put the element into the right whole and interpreted it as *Arabians*. This may not be called an illusion but the mental process is the same. It is like trying to fill in the missing letters in forms like l-nd-n. It may be London, or Linden or Landon. One's past experience and his prejudices play a large part in determining what he supplies. The Englishman would suggest London, the German Linden; and someone else the last.

We must not get the idea that man is passive amid all these impressions, that he stands around waiting for stimuli to arouse him. He undergoes the effects of his own behavior. He is active all the time. As an organism he is reacting all the time to his environment trying to bring about an adjustment of himself to it and of it to himself. His attempts at adjustment result in action which results in knowledge. He acts, then reflects, then acts again, using the experience to construct new and better experiences. That is, each experience

becomes the raw material out of which he builds a more intelligent, because better understood, experience.

**Special Senses.**—The only approach one has to the external world is thru the nerves of the special senses. It is out of the material reported to the brain thru these senses that we build our world. Each makes his own world. If he is blind, he builds a world without color, light, and shade. If he is deaf, he builds it without music, or the sound of pleasant voices. If he has no sense of feeling, he builds without ideas of rough and smooth.

To seeing, hearing, smelling, tasting, and touching, many add muscular sense and the sense of heat and cold, etc. The first five are called the primary senses and the others the secondary. We may for convenience divide the primary senses into two groups, one giving us knowledge of the physical qualities of objects. These are seeing, hearing, and touching. The other group gives us knowledge of the chemical qualities of objects. These are tasting and smelling.

**Sensory Qualities.**—Let us turn our attention to the material furnished us by the nerves of the special senses and try to understand a little more fully this raw material.

The special senses developed in animal life as a means of protection and preservation. Self-preservation depends upon food and protection from enemies. Smell and taste served the immediate purpose of determining whether or not an article was fit for food. Seeing helped to discover food and enemies at a distance. Hearing also served a similar purpose. The lion's roar heard by his prey is a protection to the prey, and the hyena that follows the lion to feed upon the bones that fall from his table and whose sense of approaching danger is much keener than that of the lion warns the lion against his enemies. So thru the ages by constant use the senses have been developed. They have not reached so high a state of development

in man as they have in some of the lower animals. Man cannot smell as the dog, see as the hawk, nor hear as the deer, but he knows a great deal more because of what he does smell, see, and hear.

**Touching.**—Touching, or feeling, as it is often called gives us impressions which we interpret as pressure. The range of this sense is very limited in extent as we must get within arm's length of the object in order to touch it at all. We get other impressions which we interpret as rough and smooth, giving us some idea of surfaces and from the surface we are often able to judge of the material. The sense of touching, or feeling, gives us ideas of pain as when there is an injury to the body from some outside agency. It also gives us an idea of pain when there is some disturbance of the internal machinery as in dyspepsia or gout.

Practically all stimuli if increased in intensity sufficiently cause pain. Very bright sunlight causes pain in the eyes and loud noises cause headache. Suddenness of stimulation will cause pain. If one puts his hand quickly into ice water, he will feel pain, or if he puts it quickly into hot water, pain will result. He may put his hand into warm water and gradually increase the temperature until the water is hot and not feel pain. The slowness seems to give time for adaptation. On the other hand, slow pressure causes pain while a quick cut with a knife, or a quick pull on an adhesive plaster, or a bullet wound causes no immediate pain. The explanation is the same as was the one which led your friends in your childhood days, when one of your first set of teeth became loose, to tell you to tie a string around the tooth and tie the other end to the door knob and have someone suddenly open the door. The tooth was out "before you knew it."

The relation between pain and emotions is a close one. One may mentally exaggerate pain until it becomes almost

unbearable. On the other hand if strong emotion is aroused one may receive a severe injury and not know that he has been hurt. It does not hurt if he does not feel it, and under the strong emotion he does not feel it.

The sense of cold and heat is located in certain parts of the body and must be considered in this connection. The entire surface of the body is not covered with these nerves. There are places not sensitive to these stimuli. Some are sensitive to heat, others to cold. Our interpretations of these stimuli as of most of the others are relative, or comparative. One coming in out of doors on a very cold day when his fingers "just tingle" with the cold, and putting his hands into water cannot guess the temperature of the water within a wide margin. Having taken his hand out of water the temperature of which is 40 degrees will make water at 60 degrees feel very warm. The laundress holds the iron close to her cheek to test its temperature. Her cheek is much more sensitive to heat than it is to feeling. I suppose that is why we say certain persons have "lots of cheek." They have little or no feeling for the feelings of others. Sometimes this particular quality is called "gall" but it is not divided into three parts.

The muscular sense is more or less closely related to touching. The sensory nerves originate, or some of them do, in the muscles as well as in the skin. These report impressions which we translate into ideas of weight and tension.

Ordinarily we think of the sense of touching as having to do with feeling with the hands and fingers. How accurately can you use your hands and fingers? When I was a boy on the farm we used to sow clover and timothy seeds mixed together and sow them broadcast. My father taught us to sow a strip eight feet wide and to determine the right amount of seed by what we could pick out of the measure with the tips of

two fingers and the thumb, and to do it so accurately that we would not vary a quart in the amount to be sowed on an acre.

To discover how accurately you can feel take a package of not less than twenty-five cards of the thickness of visiting, or calling cards. Hold them in the left hand with the end of the pack up. Close your eyes and lightly draw the thumb of the right hand over the top of the pack and each time remove the three righthand cards and lay them by themselves. When you have removed them all from the left hand count the packs and see how many have three cards each. If you do not have cards handy, use a package of envelopes. Repeat the operation three times and compare the results. You should have six correct the last time and five the first, if your sense of feeling is good. If excellent, you should have seven correct the last time. By practice you will find that your sense of feeling will improve. The same thing will be true in regard to testing rough and smooth surfaces. Here, as in other lines, practice makes perfect. It all depends upon what you practice.

**Seeing.**—The sense of vision is stimulated by vibrations in the ether which pass thru the lens of the eye and are brought to a focus on the retina where the image appears bottom side up. The optic nerves from the retina pass to the sight center of the brain, some of the fibers passing over to the other side of the brain so that both sides of the brain help in interpreting the image of each eye. There are two images to each object. When the eyes do not focus alike there is a blurred, or confused interpretation.

The waves come thru space in straight lines and from short or long distances. Because of this fact we infer distance by sense of sight, and size from distance and color, or rather by brightness. In reality sight cannot enable us to judge distance. It can only give us information about brightness and colors, but by experience we have learned that a difference in degree

of brightness is apt to mean far away or near to. We are able to judge distance too by means of muscular tension. Hold an object at arm's length and focus both eyes upon it and bring it closer, keeping the eyes fixed upon it. You will soon feel the tension of the muscles. Move it away and they relax. The degree of tension or pull gives us a clue to the distance.

The impressions gained from the sense of sight are usually classed as achromatic, or brightness, and chromatic, or color. The achromatic is divided into blacks, whites, and grays. The chromatic is divided into the color series composed of red, orange, yellow, green, blue, indigo, and violet. The chromatic is again divided into actinic and non-actinic according to the length of the waves. The actinic rays produce chemical effects, and it is now pretty well established that they are what makes it impossible for blondes to thrive in the tropics. The pigment in the skin of the brunet protects him from the actinic rays. The actinic rays are at the upper end of the color scale and are green, blue, indigo, and violet and the ultra-violet.

Some persons are born without color sense. They see the world in grays. Such persons are said to be color blind. Some are only partially color blind, being blind to red. Others are blind to green. These persons are always handicapped so far as the world of color is concerned, and they must find success in some activity into which a knowledge of color does not enter. One who is blind to red and green or to either one cannot be trusted to run trains on the railroads no matter how well equipped he may be in regard to every other requirement. He would run past signals. He would be of less value in that position than was the Irish stowaway. He was brought on board and the captain placed him at the bow with strict orders to report anything he saw. After a couple of hours, he called out, "Captain, I see a red and a green light. I think we're coming to a drug store."

The sense of color is a rather recent acquirement in the history of the race. Pictet says there were no names in Indo-European languages indicating color. Max Mueller says there is no Sanskrit root for color. Geiger tells us that the primitive Aryans were conscious of only one color. In the oldest literary composition only red and black are indicated. The Rig Veda mentions red, black, and yellow. Later there is mention of white, then still later green. Etymology shows that blue was still unknown three thousand years ago. It is a long step from the ancient Aryans who recognized only one color to the modern color expert who knows several tints and several shades of each color of the scale, and in addition knows them when applied to almost any kind of material.

Some persons are able to see at greater distances than others, and are said to be *farsighted*. Others are *nearsighted*. Occasionally one is met who cannot see after dark as the albino cannot see well in the daylight. The cause of the inability to see after dark is probably due to the lack of rods in the retina of the eyes. Birds like the owl that see well only at night have only rods which are receptors for whites, grays, and blacks in the retina of the eyes. Those that see well only in the day like hens have cones which are receptors for the colors of the spectrum in the retina and no rods. The normal visioned person has both rods and cones.

Do you know whether or not your vision is normal? Have you had your eyes examined so you know just what they can do and how well they can do it? Does your work make any demands upon your eyes that they cannot stand for years? If so you had better change.

We sometimes wonder why so many persons have difficulty with their eyes. But when we remember that in former generations very little reading was done and very little work of any kind that required close eye application and that what was

done was all done by daylight as there was no artificial light that one could work by, and then recall that with all the books to be read and close work to be done, much of it by artificial light that makes it possible, even if unwise, for one to use his eyes for twelve, fifteen, and often eighteen hours out of twenty-four, it is no wonder that we are finding many weaknesses of the eyes that former generations never dreamed of.

**Hearing.**—The last of the senses that give us information about the physical qualities of matter is the sense of hearing. Waves of air strike the inner ear and stimulate the auditory nerves which carry the impression to the neurons of the cortex after which the mind interprets them as sound. Ears differ much in their capacity to receive sensations, as minds do in their ability to interpret them.

Until the vibrations of the air reach 16 per second we cannot hear and some persons cannot hear as low as that. Most persons hear vibrations ranging from 16 to 50,000 a second. The human voice has a range from about 87 to 768 per second altho some singers have a much wider range. It is said that Christine Nilsson's voice reached 1361 vibrations. You see the range of the ear is far beyond the range of the voice. This enables us to appreciate musical instruments that range very high as well as those that have a very low range.

Sound vibrations are usually divided into two classes, noise and tone. Noise results from rough, interrupted vibrations. Tone results from smooth, uninterrupted vibrations. Tones are classified according to pitch, intensity, and timbre.

Pitch depends upon the number or *frequency* of vibrations. Intensity depends upon the *amplitude* of the vibrations. Timbre, or quality depends upon the *material* which is caused to vibrate. We readily recognize the quality of the sound of the piano, flute, cannon, cricket, and trombone as they each produce a different form of vibration than any of the others. Scientists

tell us that the quality is determined by the number and the intensity of the overtones, or harmonics.

There is a rhythmical sequence of related tones which we speak of as *melody*, and another relationship between two or more tones sounding together which we call *harmony*. The ability to enjoy the relationship of tones varies to a remarkable degree. One person likes only music with a tune to it. He has no use for highfaluting music, and another thoroly enjoys the closest harmony and the heaviest operas.

It is not unusual to find at an orchestra concert one who just *hears* the music, another who enjoys the rhythm and swing of all the parts, while another enters heart and soul into the interpretation of the themes, and finds himself responding to every change presented by the musicians. This is not so strange when we recall that music is one of the latest acquirements of the race, that only 50 per cent of us have any musical sense at all, and that only three or four in ten thousand have a real musical sense. We may all receive the same impressions from the waves of sound but most of us are unable to make any intelligent interpretation of them. Yet the best human ear can detect ten thousand steps in pitch.

While the musical sense is one of the latest acquirements of the race, the sense of hearing is one of the oldest and most firmly fixed. One's ability to understand his world and to adjust himself to it depends in a large degree upon his hearing. If he does not hear well, or at all, he is badly handicapped. He will be shut out of many lines of activity where otherwise he might find splendid opportunity for the development of his other powers. Each one of us should make the necessary effort to know just what degree of efficiency we may hope to attain thru the use of each of the senses and how we may measure up to the best of our capability.

**Smell.**—The sense of smell and the sense of taste give us information about the chemical qualities of matter. One may look upon many things. He may listen to many things, but is seldom killed by what he sees or by what he hears, but unless one acts quickly he may be killed by what he tastes or by what he smells. Smell and taste are the sentinels which guard the gateway to the lungs and to the stomach. One cannot live in a room filled with poisoned gas, and his nose lets him know when it is time to move.

Under ordinary circumstances we readily adapt ourselves to odors and fail to recognize their presence. The sense of smell rests in the olfactory nerves, the ciliated cells of which are imbedded in the mucous membrane of the nose. The intensity of an odor depends upon the number of particles emitted by the object. The sense of smell rivals the spectro-scope in detection of minute particles of matter. A good nose can detect 1/2,000,000 of a milligram of musk and 1/2,000,000,000 of a milligram of mercaptan, one of the vilest smelling things man has made. Smell is about 24,000 times as sensitive as taste and has a great influence upon the emotions.

Smells are surer than sounds or sights  
To make your heart-strings crack.  
—KIPLING.

The odor of delicious food tends to arouse emotional energy to a high pitch. We do not wonder that Esau was so stirred by the odor of the mess of pottage that he was willing to trade almost anything for it. His emotions were aroused to a pitch beyond his control.

**Taste.**—The sense of taste is in the gustatory nerves. The *taste buds* are connected with the receiving nerves along the sides of the ridges of the tongue. They are stimulated by substances in solution only.

There are four recognized tastes, sour, soapy, bitter, and

sweet. The acid, or sour, taste is the perception of the hydrogen atoms charged with positive electricity. It is easily recognized by anyone who has tasted the leaves of the sorrel plant. The alkaline, or soapy taste is the recognition of the hydroxyl element charged with negative electricity. The other two are well known to all of us by their names and by experience. We all know what bitter means even tho we may have trouble to define it, so also with sweet.

Flavor or aroma is a sort of compound of taste and smell. Coffee does not taste nearly so good if you hold your nose while you drink it. That is one reason why cold coffee does not taste so good as hot. We cannot smell the cold coffee as we can the hot. It is a combination of taste, smell, and touch that makes ice cream so pleasant. Think of the flavors we pay good money for when we buy ice cream flavored with chocolate, vanilla, sarsaparilla, etc. Millions of dollars' worth of these perfumes and flavors are manufactured every year and sold at a profit. The odoriferous oil in violet perfumery costs about \$10,000 a pound yet there is a ready market for it and for almost anything else that pleases the sense of taste and smell.

**Sense Limits.**—There are limits to the power of the senses to report impressions. As they do not report the effect of waves of air below 16 a second, they do not report the effect of waves above 50,000. When waves reach 18 million a second the reporting begins again but instead of reporting as sound the report is of heat. Then there is a wide range from which no impressions are recorded. When the waves reach 395 billion a second we begin to receive reports of light and color. There is a continuous reporting until the number of waves reaches 757 billion a second which we interpret as the violet ray. Beyond this are the ultra-violet waves which the eye

cannot interpret directly, but which are known by their effects, and beyond these the X, alpha, beta, and gamma rays.

**Our Stock of Percepts.**—There must be a constant receipt of new perceptive material if one's mental growth is to be continued. One cannot make bricks without straw, neither can he build ideas without perceptive material. The avenues of approach to the mind must not only be kept open but they must be used. There are two essentials in the perceptive process that should be kept constantly in mind. They are accuracy and speed.

The first essential is accuracy. Inaccurate perceptions are a handicap but accurate ones are an advantage. Careful observation is the great essential. See and see correctly. One of the best ways to test your powers of observation is to attempt to make a sketch of what you have seen. Agassiz said, "A pencil is the best of eyes." When one attempts to draw he realizes how he has overlooked the details of the thing observed.

Every one of us can increase greatly his ability to see things. Three men looked at something lying on a table. One reported that there was nothing there except a pen or pencil. The second reported that there was a fountain pen. The third reported that there was a Waterman fountain pen with a clip cap on it. The difference in the ability to see could hardly be better illustrated.

Recently in a meeting of a men's club in New York some simple observational tests were given. One of the number was called upon to read a short selection. When he had retired from the stage the men were asked to answer several questions about him, some of which were as follows:

- 1 What is the color of the reader's suit?
- 2 Is his collar high or low?
- 3 Is he tall or short?
- 4 Is he stout or slim?

- 5 Is he blonde or brunet?
- 6 Are his shoes black or tan?
- 7 Is his hair parted in the middle?
- 8 Does he wear a bow tie or a four-in-hand?

More than half of the men present gave incorrect answers to over half the questions. Inaccuracy of observation was clearly manifest. If the promotion of those men depended upon what they could see, they would have been disappointed.

The speed of perception is almost as essential as the accuracy. The world wants men who can do things accurately but it wants them done speedily. "Time is money" is what we hear on every hand. It is not any wonder that we live in poverty when we remember how much time we waste. We must learn to see and *see now*. It is surprising to discover the speed in observing we can attain thru practice. We can learn to look as tho we were never to get another chance. We can fix as in a photograph the entire scene if we will and then recall it at leisure.

The growth of the mind depends upon the constant reception of new sense-perception material. We cannot emphasize this too much. The mental life of tomorrow depends upon the material you have selected today. Give thot to the selection today. A growing self-consciousness should be your constant aim. Making of yourself a successful salesman, a successful lawyer, a successful preacher may be important, but vastly more important is making of yourself a man. After that one can make many things of himself. Before that he can make nothing but failure.

One must continue to come into contact with the universe at an increasing number of points and this must be done thru the use of the senses. The world is not changing very much but man is changing rapidly. Think of what iron ore meant to primitive man and what it means today. Where early man saw simple iron, the chemist of today sees steel in all its forms

and sees new possibilities thru alloys that the man of even a generation ago never imagined. What has caused all this change? Iron has remained the same, but man has grown. An ever increasing self-consciousness has made this advance possible. You cannot extend your viewpoint one iota without extending yourself. An enlarging viewpoint means an enlarging life. Observe, read, study, attend lectures, get more facts, establish new viewpoints. The richness of your life is within you.

We live in deeds not years, in thoughts not breaths,  
In feelings not in figures on a dial.—FESTUS.

Are your surroundings discouraging? Do you feel that if you were in another's place success would be easy? There is an external environment that we cannot change. One cannot change his race. He cannot change the climatic conditions of his part of the world, but these are minor things. One's real environment is within himself. The factors of mental growth, of success, or failure are yours. Perception is a condition of the mind. You are responsible for your state of mind. You make your own world, and you choose the material out of which you build it. Have you chosen wisely? Well and good. Have you chosen unwisely? Then choose again. No one has failed so long as he can begin again. Every morning brings a new opportunity.

They do me wrong who say I come no more  
When once I knock and fail to find you in;  
For every day I stand outside your door  
And bid you wake, and rise to fight and win.  
Wail not for precious chances passed away,  
Weep not for golden ages on the wane!  
Each night I burn the records of the day—  
At sunrise every soul is born again!

—MALONE.

## CHAPTER III

### CONCEPTS AND JUDGMENT

AS we have already noted, the human individual is a continuous unfolding from the germ cell to adulthood. There is much modification but no new factors appear. The behavior of the various groups of cells and of the different organs of the body is largely the result of what we have called "Cellular intelligence." It is probably not so much the result of reasoned processes as we used to think, nor is it the result of chance. Behavior is more the result of, or rather response to, impulses and desires. These arise because of certain stimuli which affect the nervous system and are interpreted as sensations and perceptions giving us information about the qualities of material objects, such as color, form, weight, size, etc. Sense training, therefore, is the logical beginning of all education, and its continuance is essential to anything like a complete and harmonious development of the mind. Securing the supply of sense-percepts depends upon us.

What have you done since studying the second chapter to improve your sense-perceptive material? Remember that *knowing how* to improve does not mean improvement. Improvement comes thru *knowing* and then *doing*. Knowledge is not power; it is a means to power. One must use the means. You may come to know thru these chapters all of the fundamental principles of mental operation and how these principles may be applied, but unless you apply them, you will not increase your ability. "The fault, dear Brutus, is not in our stars, but in ourselves that we are underlings."

Do not make the mistake of thinking that you are going forward by leaps and bounds. Your mental growth is slow just as your physical growth is. You have attained your present weight by taking food a mouthful at a time, digesting it, assimilating it. Your mental growth proceeds in the same way, an observation here, a reflection there, but never without effort, and at the best a consciously directed effort.

**Relation of Percepts to Concepts.**—We begin life without any neuron patterns. As soon as consciousness appears, we begin to receive impressions from the outer world. These sensations are indefinite, unclassified, undifferentiated. Very gradually the mind begins to localize the source of these impressions as here, there, elsewhere. The child finds the world, in the words of William James, “a big blooming confusion” and proceeds very slowly to relate it to himself. His first conclusion seems to be that it is all one. He does not at first distinguish between himself and things around him, but as time goes on and his experience broadens a bit, he learns that the teddy bear and his blocks are not a part of himself. He has then made a distinction between self and not-self. He is all the while receiving impressions thru the senses and interpreting and relating or referring them to definite sources. These interpretations, as we have already noted, are the results of perception and are called percepts.

Just as sensations furnish the raw material out of which percepts are made, so percepts are the raw material out of which concepts are made. A percept is the result of immediate experience, but a concept is not such a result. A concept is mediated, or in other words, is arrived at thru something else. It is a new meaning, or an old meaning seen in a new way or under different circumstances.

**Concepts.**—A percept is an idea of a particular thing or quality; a concept is an idea of a general group or class of

things. One may have a percept, let us say, of *a* chair, a *particular* chair which he sees or has seen. He may have also a concept of a *chair*, not any particular chair, but an idea that includes *all* chairs. This idea he arrives at by considering not a particular chair only but by observing many chairs. That is, he arrives at the concept chair *by means of* the percepts of many chairs. So we say the percept is the result of *immediate* experience while the concept is *mediated thru*, or *by means of*, something else.

A percept may be *a* horse. The concept is *horse*, the class which includes any and all horses. A percept may be Woodrow Wilson. The concept would be man, the class which includes any and all members of the human race. A percept may be a concrete object or a proper noun. The concept would be an abstract quality or a common noun. As you see, dog does not mean the same as *this* dog. *This* dog may have short legs, long hair, long body, short nose, but dog is the name of all dogs everywhere. *Concepts are ideas of classes of actions and of things.* Concepts must contain all the *essential* elements of the group and none of the *incidental* elements. *Body* is an essential element in a dog, but *long* body is not. Hence, long is incidental and cannot appear in the concept dog. If by any chance one's notion of *dog* includes the element *long body*, it will be evident that he has not seen all kinds of dogs.

**Conception.**—*Conception is that act of the mind thru which it forms an idea of a class.* A class is a group of individuals which resemble each other in some particulars. We are not able to form a mental picture of a class as we are of an individual. Usually when the word *dog* is mentioned we think of some particular dog but we feel at the same time that the image of any other dog would satisfy us just as well. A mental image always represents qualities and particulars of an individual object. Conception can embody only those qualities

common to the entire class. If the concept is of apples, it must not contain the percept of a spot or wormhole. Yet the concept must always be interpreted in terms of certain individuals of the group. The concept can mean nothing apart from the individuals from which it took its rise. One's concept of dog can mean nothing apart from the individual dogs he has seen. When the word apple is mentioned, we find our minds running to the percept red, then quickly, to green, yellow, etc., to sweet, sour, to dry, juicy, and finally coming to rest, let us say, with the idea of the early harvest apples that we liked so well in our younger days and which we regard as our ideal of what an apple ought to be.

**Formation of Concepts.**—We have seen what conception is and what concepts are. Let us consider now how they are formed. We cannot remember how we first formed concepts, but we may be able to analyze the process clearly enough to answer our purpose.

The little child when it first begins to talk calls all men "daddy." He does it because he sees no difference between his daddy and the others to whom he applies the name. He has only very indefinite ideas of *particular* men and he has just as indefinite ideas as to the *class* of men. This is due to the fact that the mind of the child as well as that of the adult perceives likenesses before it does differences. We recognize this in the somewhat common expression, "All coons look alike to me." To the average American the appearance of Japanese, Chinese, and Koreans is quite the same. I happened to be in Germany at the outbreak of the Great War and with quite a group of other Americans suffered some inconvenience and annoyance by the German military and citizenry because they thought we were English. They were not able to distinguish the differences in looks and speech between the American whom at that time

they regarded with some little respect and the Englishman for whom they had less.

In my high school teaching I had twin sisters who were as like as "two peas in a pod" at least so they appeared to me when they first entered the school. For some weeks I was continually confused as to which I was talking with and some of the teachers were never able to identify accurately either of them. However, after several weeks I began to notice differences in them and as I became better acquainted with them I noticed still other points of dissimilarity until I wondered how I could ever have confused them. The point is that I could not distinguish them apart until I did discover the differences.

I see a man coming down the road. I am sure it is Jim Smith. A few minutes later I conclude that it is either Jim or his father. I can tell by the walk. When he gets near enough for me to note that it is the younger man, then and only then, am I certain that it is Jim.

We cannot perceive individuals without perceiving differences. The child will be able to distinguish his father from other men when he learns to note the difference in clothing, beard, voice, etc. To the child geese and swans look alike and if he is familiar with geese and not with ducks, he will on first meeting ducks be quite apt to call them little geese.

In much the same way he makes the distinction between self and not-self, putting the teddy bear and the kitten into the not-self group. As his experience broadens he finds that he may put them both into the basket and teddy bear will stay there but often the kitten will not and then he has noted other differences and he subdivides the not-self group into living and non-living. Of course, he does not use these terms.

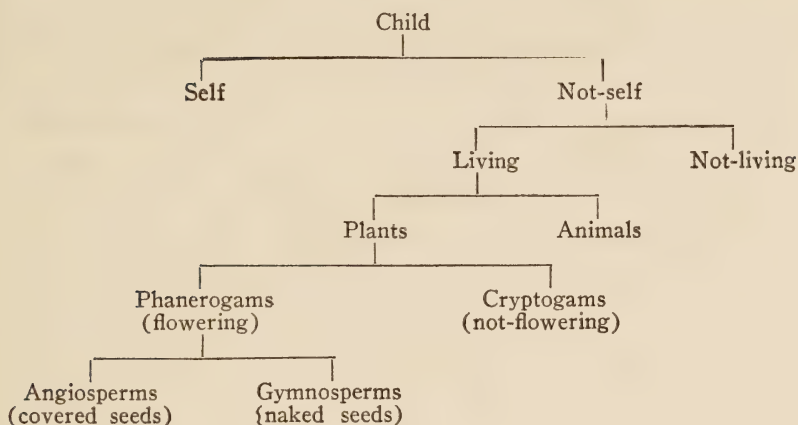
I was interested last summer in noting how a little niece of mine was making these differentiations or rather had made them. She put the teddy bear and the kitten both into the

basket and then for some reason ran into another room returning in a minute or so. While she was gone the kitten jumped out of the basket and ran away. When the little girl returned she looked up at me and pointing to the basket said, "Kitty gone," and said it with an air which indicated that she was not a bit surprised, that that was about what one would expect of a kitten anyway. She then ran out to get the kitten. While she was gone I took the teddy bear out of the basket and placed it where she could not readily see it. When she returned to the basket and found it empty she was in a quandary and looking up at me with wide open eyes and pointing at the basket said, "teddy gone." The expression on her face and the tone of her voice indicated that while she was not surprised to find the kitten gone she was very much perplexed to find the teddy bear gone. She had never done that before. She had already made the classification of living and non-living.

Later the child makes distinctions among things that are alive and classifies them as plants and animals. Then plants are divided into those that bear flowers, called phanerogams, and those that do not, called cryptogams. The flowering plants are divided into two groups, those having the seed covered, called angiosperms, and those that have not, called gymnosperms. This process is a continuous differentiation among the individuals of a larger group. The result may be indicated as shown on page 61.

In the same way differentiation is carried on among non-living things and the sciences of physics, chemistry, physiography, meteorology, etc., result. The subdivisions of the animal group are arrived at in the same way.

The child and even the adult may not form very clear concepts at any point of the way. At best there will always be a rather indistinct boundary between groups, a sort of twilight area as tho one could not see distinctly. For instance, it is not



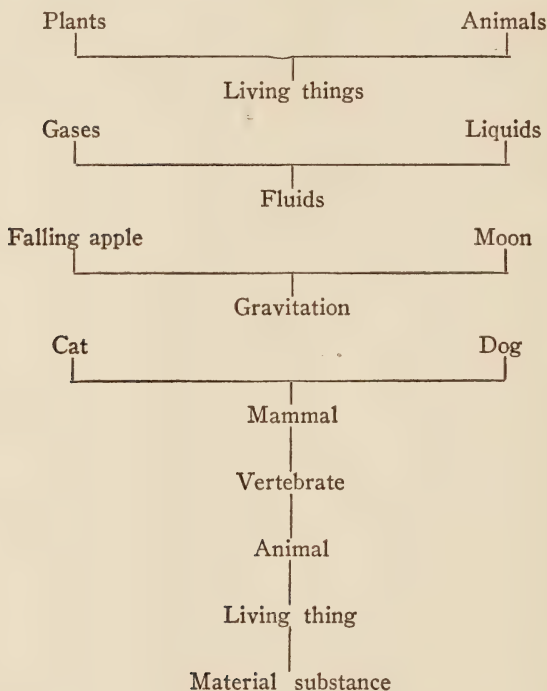
easy to know the concept *life* or *alive*. It is not easy to tell whether or not a certain object is alive. Just so it is difficult to distinguish between plants and animals. It seems easy because we deal with things far from the margin of the group like horse, the animal, and horse-chestnut, the plant, but when we deal with the microscopic single-celled object it is difficult to say whether it is plant or animal.

**Analysis and Synthesis.**—There are two processes employed by the mind in dealing with objects of experience. One is the process of separating an object into its parts. The other process is the combining of the parts into a whole. The first is called *analysis*; the second is called *synthesis*. Both processes must be employed in order to give one a fairly good check on the accuracy of his concepts.

As we know, sense-percepts lead to a knowledge of individual concepts which may be joined to form larger groups, and these may be joined to form still larger ones. The satisfaction that comes to a child when he recognizes for the first time that plants and animals are alike in that they both have life, that gases and liquids are comprised in fluids, and so on, is like

that of the adult who has discovered likenesses where he thought only differences existed. I suppose it is the same feeling that Newton experienced when he realized that there was a common element in the falling apple and in the moon in that both were compelled to obey what we call gravitation.

The synthetic process may be indicated as follows:



All concepts are formed by means of these two processes. The concept is never definite until both processes have been followed out.

The chemist thinks of rubber and wonders what it is composed of. He goes into his laboratory and analyzes it and learns what all the parts, or elements, are. Then he goes out

and seeks for these elements here, there, anywhere, and having found them puts them together in the right proportions and makes rubber, which because of the method followed is called *synthetic* rubber.

Children in school are taught to *analyze* sentences in the language class, problems in the arithmetic class, etc. This is for the purpose of having the members of the class get a clear idea of what the essential parts of a sentence are, or to have them get such a clear idea of a problem in arithmetic that they see what parts are *given* and what ones are to be *found*. By one's ability to analyze a problem is determined his place and his rating in the class.

Then, again, the class is given certain words to be used in sentences. Then the *synthetic* process is brought into play. If one can analyze a sentence correctly and can build a correct sentence having certain words and conditions given, his concept of *sentence* will be fairly accurate.

These two methods, or processes, are carried on extensively in every business and profession. Every concept employed in banking, railroading, preaching, manufacturing, merchandising, etc., is arrived at in the same way, and other things being equal the person with the most concepts is the best equipped for success.

**Steps in Concept Formation.**—There are definite steps thru which the mind passes in arriving at a concept. It will be well for us to look carefully at them. That is, we will *analyze* the process into its parts.

The steps are as follows:

1. *Observation.* One must observe many objects carefully and form images of them. This requires time and is a slow process if well done.

2. *Comparison.* One must see clearly the agreements and

the disagreements, the likenesses and the differences among the different objects seen.

3. *Abstraction.* One must think only of the common, or essential qualities, the likenesses, and then reject, or overlook, the non-essentials. He must abstract, take away from all the elements, only the common ones.

4. *Generalization.* One must then put all the objects having like or common qualities into one class, or genus. When we have done this we know that these qualities will be found in every object in the group.

5. *Name the concept.* The name is a tag, or label, or a string with which we tie things together into bundles. We must be sure to make the name general because it is to be applied to a class or group. In naming the concept one must have regard to the next larger group and define or name the concept in terms of it. For instance, one might define cat as a *material substance* which is correct but which is too indefinite. If one says that a cat is a mammal, he is much more accurate than he would be to say that a cat is an animal altho both answers would be true.

**Value of Clear Concepts.**—The ideas of children are necessarily hazy because of the lack of experience. The child hears words used in regard to certain things and forms his concepts of things accordingly. To a child "far away" does not mean what it does to his father. Narrow means to him the width of pieces of ribbon, pieces of boards, etc. He, like adults, measures the *unknown in terms of the known*. To one who has never been a hundred miles from home distance is wrongly conceived. The stream where the old swimming hole was, was to us a wide stream. The hill back of the house was very high. Its top almost reached the sky. In most of our early concepts the proportion was sadly awry. We had to

observe many, many instances before we succeeded in correcting them so they would even begin to approach accuracy.

The chief reason for inaccurate, hazy concepts is the fact that our perceptive material is inadequate, and then, there is always a tendency to generalize too hastily. The Psalmist says, "I said in my haste all men are liars." (Ps. 116:11) If he had been in less of a hurry and observed a few more men he would not have been so apt to call all men liars including himself. We often try to make a standing jump from the particular to the general without exploring every foot of the way. This makes for hazy concepts.

If one has been deceived, he jumps to the conclusion that all men are false. If he has been cheated in business, all men are rascals. If one has trouble, this world is a vale of tears. One carries a rabbit's foot to bring him good luck, and another looks at the tea-grounds in his cup to learn whether or not he is going to have visitors. A man said to me recently, "Never trust a curly-haired Italian." He had found one Italian who could not be trusted and he happened to have curly hair, so he made a hasty generalization that all curly haired Italians are untrustworthy.

Think of some of your concepts and see just how clear they are. What is your concept of republican, democrat, socialist, Bolshevik, soviet? What is your conception of Protestant, Romanist, Jew? How did you arrive at your concept? Have you clearly perceived the elements that enter into the concept of any of these groups as held by those most friendly to such groups? Why are you an adherent of a certain religious body? Have you made an honest effort to form a correct concept of what the group stands for? That is, have you formed an accurate, clear concept, or have you inherited your religion and politics as some persons do their parents' money?

What is your conception of revolution? Do you have the

same idea of it when you think of George Washington as you do when you think of Lenine? What is your conception of right, wrong, good, bad? What is your conception of the relation of capital and labor? What is your conception of democracy? Will your concept of democracy apply to industry and religion as well as to politics?

These and many more subjects are of very vital importance to every live man and woman, and yet vast numbers of fairly intelligent persons have only the most hazy ideas about them. They have strong opinions which all too often are based upon prejudice, but as for clear concepts they have few.

**Growth of the Intellect.**—The growth of the intellect is indicated by the number of accurate concepts one has. A growing mind is always forming new concepts and clarifying old ones. One begins to stagnate mentally when he gets to the point where new ideas disturb him. Many of us are like the mother of the young woman who went to hear Charles Darwin lecture on the "Descent of Man." She went home and told her mother that she believed that Darwin's theory was correct and man had descended or ascended from some sort of lower animal life. Her mother replied, "That may be so, but if it is let us pray God that just as few people as possible may find it out." She was afraid that her old concept of the origin of man would be upset and she did not want to have to go to the trouble of developing another concept.

In order to maintain mental flexibility one must be continually forming new concepts and clarifying old ones. Concepts of a real live person are bound to change. Reinterpretation of his experience is continually going on. It is a lack of a good stock of concepts that makes it hard for one to change occupations late in life and succeed. One has lived with one set of concepts so long that the energy required to develop new ones is too great for him to muster. For instance, one who

has worked for years in a paper mill has had to develop an entirely different set of concepts than one who has been employed in the steel industry. His mental and muscular reactions have been built up in connection with his stock of concepts, and they are too rigid to change, and when he is thrown out of industry for any reason, he is unable to get back unless he can get into the same work.

**Adequate in Scope.**—One should aim to make his concepts adequate in scope as well as in number. Think of the farmer's conception of red clover. He usually thinks of it as a plant that makes good fodder for stock and the roots of which enrich the soil. The concept of the botanist includes a knowledge of structure and function of the plant, of the family to which red clover belongs, the climate and the kind of soil in which it grows. The concept of the physicist includes questions of osmosis of liquids, circulation of the sap and other purely physical phenomena. The concept of the chemist will consist of a knowledge of the chemical reactions carried on by the plant. His concept of red clover is that of a laboratory where chemical processes are carried out. The bacteriologist thinks of red clover as a plant the roots of which provide opportunity for certain bacteria to grow and thru growth to take from the atmosphere quantities of nitrogen and build it into the roots of the clover which are then released to feed other plants. The concept of the geologist involves a knowledge of what materials are built into the structure of the plant, from the disintegration of what rocks the material came. Are they the new or older rocks of the earth? And at once the age and history of the earth enters into his concept.

To all this must be added a knowledge of what the clover has added to the civilization of the world thru providing food for man.

To have an adequate concept of red clover one should have

the essentials of all of those of the farmer, the botanist, the physicist, the chemist, the bacteriologist, and the geologist. So we see again the necessity for wide experience requiring consideration of an ever increasing number of details or particulars.

**Speed and Accuracy in Generalizing.**—The development of concepts is a slow process. It took the race ages to distinguish between mind and matter and according to present ideas of science, the line of demarkation cannot be drawn with certainty now. Max Mueller says that all the concepts that ever passed thru the mind of ancient India may be reduced to one hundred and twenty-one root concepts. When we recall the height to which that people attained in order to produce such a language as the Sanskrit and then recall that the root concepts number only one hundred and twenty-one, we are impressed with the slowness of the development of concepts.

It is a slow process for a child to comprehend that two apples and two apples make four apples, but it is a much longer and slower process for the child to comprehend that two twos of anything make four, and then to complete the generalization and know that two and two make four. It is difficult for the child to see that *four* horses, *four* cats, *four* dogs, *four* cows, all resemble each other in being *four*. The difficulty is well illustrated by a story told of some English sailors. One of their number said to the group of eight or ten, "If a 'errin' and a 'alf cost one and 'a pence what will twelve 'errin's cost?" The group wracked their brains in silence for several minutes. Then one of them said, "Eh, Bill, and did you say 'errin'? I'll be blamed if I aint been figgerin' all the time on mackerel."

The process of differentiation is as slow with adults as with children. We all have some kind of a concept of the great American product corn, or *mahiz* as the Indians called it when Columbus arrived. For several generations the concept of

corn included the particulars of its growth and something of its food value to man and beast. We recognized the stalks as food for cattle and the cobs for pipes, and that the grain itself could be made into corn meal and corn starch, but now a concept of corn that is accurate and uptodate must include the particulars about the more than a hundred different commercial products made from corn and which add millions of dollars to the value of the corn crop every year. It was difficult for us to see these elements, such as corn oil, oil cake, oil meal, dextrose, corn syrup, tanners' sugar, and about two dozen others, in corn, yet they were there and someone found them.

What has happened with corn has happened with cotton until about three dozen different articles produced from cotton are on the market. These so-called by-products add \$150,000,000 to the value of the cotton crop annually.

Now, think of this in connection with your own business or profession. Are you thoroly familiar with all of the concepts employed by the best men in that line? Do you know the relation of departments to each other? In other words, are you "at home" in the business? If not, you can have only a small measure of success at the best. Many a man thinks he is in a blind alley when he has scarcely made a beginning in sounding the possibilities in his field. One has not sounded the depths of his present position, nor its breadth of opportunity, until he has mastered all the concepts employed by the masters of the business and has become familiar with all the particulars which enter into those concepts.

Inaccurate concepts are one of the great handicaps to progress. So often we do not see all the particulars that enter into the generalization, or in other words are unable to make a generalization because we do not recognize the particulars. That was the difficulty with the workers in England when the power loom was invented. They saw in it a machine that was

to throw them out of work, and so they burned all the machines they could find. When Whitney invented the cotton gin the same thing happened in the United States. None of the workers saw that the machines would reduce the cost of cloth and multiply its use, thereby increasing the demand for workers on farms and in mills and factories.

The same attitude was assumed by the Christian church in regard to science in the sixteenth, seventeenth, and eighteenth centuries. The Christian leaders, because of the narrowness of their concepts, thought science would destroy the church and maybe Christianity too, and so they set themselves out to destroy it. The possibility of Christianity and science being combined as particulars into a larger concept was beyond the reach of the imagination of most of the theologians. However, science was not destroyed. A more careful weighing of the particulars, or essentials of both, has resulted in forming a new concept of life, and the former enemies of science are now its most devoted supporters.

Germany in the past seventy years serves as another example of inaccurate generalization. She became possessed of three notions which were destined to be her undoing. First: she assumed she had the best culture in the world. Second: she believed she was called of God to make that culture world-wide. Third: she believed she had an invincible machine with which to do it. Probably no people ever blinked the facts as Germany did. Probably no people ever knew more about theoretical psychology and so utterly failed in its application as she. It was with Germany as with many individuals. All too often the wish is father to the thought. The great danger of half truths is that they are the product of faulty concepts.

**The Safeguard.**—The only safeguard against faulty concepts is the careful re-examination of the particulars from which the concepts are derived. Such re-examination often

reveals elements in the particulars that were overlooked at first. A careful analysis and a careful synthesis are the only correctives for faulty generalization. Without these we are apt to narrow the idea of the class to fit the particulars with which we are familiar.

**Language.**—When we have completed the analysis and the synthesis we are at the place in mental development where *names* become useful. It is useless to teach names to children before they have learned the classes to which the names apply. We have noted that words are signs, tags, or a string with which we tie things together in bundles. In the first text-book on grammar I ever studied, we were taught that a word was the sign of an idea, but it is hardly that. If it were, the word would always recall the idea, but many persons know words and do not have any ideas represented by the words. What words do is to recall or arouse experiences. If one has had no experience, the word cannot recall or arouse any. Hence, words which do not arouse experiences are not only useless but serve as encumberers of the mental ground. The child receives an impression of darkness which he is taught to call black. The object moves around the room. He learns to call it "dog." He perceives the object. He forms a neuron pattern, which when stimulated gives rise to the consciousness "dog." He feels the dog's hair. The dog licks his hand. These patterns are tied together to form a more elaborate pattern. The word recalls this pattern.

Language serves as a means of communication and also serves to preserve the results of thinking by enabling us to recall a concept without repeating the entire process by which we first arrived at the idea.

Language is both oral and written and in either case must serve to arouse experiences to be of any value. It is difficult to express a concept in words. It is difficult to interpret a

word so as to get an accurate idea of the concept it is intended to convey.

Language should always be on a par with the mental level. Words should not be learned until one attains the mental status that enables him to comprehend the essentials of the objects included under the name. One may be taught the word "ten" so he can recognize it anywhere and yet have little or no conception of the objects or units which it represents.

Of course there is no need for oral language until class notions begin to be formed. Sometime later signs begin to be used to indicate objects and actions. The simplest signs that another may learn to interpret more or less accurately are written language. Concepts are class names, and names are in reality definitions. Language is a measure of concepts and the accurate use of language is one of the best indications of the development of the mind. As we have already noted, there are many persons who use words without much notion of their meaning but who use them fairly accurately in general conversation, expressions such as "psychological moment," "efficiency," "system." They have acquired the use largely by imitation and any examination into the particulars of the concept conveyed by the words shows how hazy the real meaning of the word is to the user.

So certain have the psychologists become that one's intellectual ability may be determined by the use of language that Prof. Lewis M. Terman has prepared a list of words, the use of which it is claimed will indicate intellectual standing within 10 per cent of the famous Binet-Simon scale. Professor Terman derived his list of 100 words by taking the last word in every sixth column of a dictionary containing 18,000 words which are probably the most common in the language. The assumption is that any 100 words selected at random or accord-

ing to some arbitrary rule will give the same result. Tests enough have been made to indicate that the assumption in regard to determining one's intellectual level is fairly well justified. It has been determined that for every word known in such a list, the individual knows 180 other words. Using 180 as a sort of safety factor and multiplying the number of words known by it one will arrive at the number of words in one's entire vocabulary.

Of course there may be cases where one may use words correctly and not know the concepts well enough to know the 180 related words, but that will be quite apt to be offset by failing to indicate a correct use of some of the words in the list. To find the entire vocabulary of an individual multiply the number of words known by 180. Thus if one uses or defines 60 words correctly he has a vocabulary of  $60 \times 180 = 12,800$  words. The following is a list of the standards arrived at as a result of many examinations:

Mental level of eight years .....	20	3600
" " " ten " .....	30	5400
" " " twelve " .....	40	7200
" " " fourteen " .....	50	9000
Average adult .....	65	11700
Superior adult .....	75	13500

If you wish to test yourself, take the following list of words and write each one in a sentence using it in such a way as to indicate that you know what it means. Care must be exercised in order that not only the word be used correctly but that its use indicates that you know what the words mean. For instance, you may write for number two, "We built a bonfire." The sentence is correct as to structure and probably as to fact, but it does not show the meaning of the word for you can substitute any number of words for bonfire in the sentence and have something like the following:

We built a {  
 bonfire  
 boat  
 ship  
 playhouse  
 tennis court

But if you had written "We raked the leaves from the yard and built a bonfire of them," you have made such a use of the word that it is quite impossible to mistake its meaning.

It should be remembered also that intellectual level is not dependent upon education, but is independent of it. One comes somehow to know these things whether he has studied much or little. He needs to know reading, counting, and a little logic. Natural ability does the rest.

The list of words used by Professor Terman :

1 orange	35 insure	68 milksop
2 bonfire	36 stave	69 philanthropy
3 roar	37 regard	70 irony
4 gown	38 nerve	71 lotus
5 tap	39 crunch	72 drabble
6 scorch	40 juggler	73 harpy
7 puddle	41 majesty	74 embody
8 envelop	42 Brunette	75 infuse
9 straw	43 snip	76 flaunt
10 rule	44 apish	77 declivity
11 haste	45 sportive	78 fen
12 afloat	46 hysterics	79 ochre
13 eye-lash	47 Mars	80 exaltation
14 copper	48 repose	81 incrustation
15 health	49 shrewd	82 laity
16 curse	50 forfeit	83 selectman
17 guitar	51 peculiarity	84 sapient
18 mellow	52 coinage	85 retroactive
19 pork	53 mosaic	86 achromatic
20 impolite	54 bewail	87 ambergris
21 plumbing	55 disproportionate	88 casuistry
22 outward	56 dilapidated	89 paleology
23 lecture	57 charter	90 perfunctory
24 dungeon	58 conscientious	91 precipitancy
25 southern	59 avarice	92 theosophy
26 noticeable	60 artless	93 piscatorial
27 muzzle	61 priceless	94 sudorific
28 quake	62 swaddle	95 parterre
29 civil	63 tolerate	96 homunculus
30 treasury	64 gelatinous	97 cameo
31 reception	65 depredation	98 shagreen
32 amble	66 promontory	99 limpet
33 skill	67 frustrate	100 complot
34 misuse		

**New Concepts.**—New concepts are constantly being formed and so new words to indicate them come into use. There has recently been prepared a dictionary of war words in which are listed 5000 new words that came into use in our language because of new concepts formed in American minds during the war.

If concepts and words are properly related, we shall come to attach to the word the same meaning that we formerly attached to the object or to its image. Then hearing the name will serve the same purpose as the percept which we received from the object itself. Furthermore, the name will help to preserve the system into which we gathered the group of particulars. For example, the word *plant* is a sign for all of the different specimens in all of the 176,000 or more species in the vegetable kingdom. *Physics* is a sign for those phenomena of nature which are included in mechanics, hydraulics, pneumatics, motion, sound, heat, light, electricity, etc. When we think of the word we do not think of all these details, and yet, we must be familiar enough with these that we shall not include chemical processes under the term physics.

There is a great saving of effort in the use of names. Symbols take the place of many details. There is little more mental effort required in the thinking of a great scientist than there is in the thinking of the Australian Bushman. The scientist uses many signs as representatives of a great many details while the Bushman is obliged to deal continuously with the details. The expert mathematician deals with the problems of higher mathematics with as little effort as the arithmetician does with the more elementary ones for the same reason. One classifies extensively: the other, very narrowly.

**Judgment and Judging.**—Usually when we think of judgment or of judging, we think of a judge on the bench, or perhaps of God at the last judgment. We are quite apt to get the

idea that judgment is an arbitrary process which the judge on the bench could omit if he only would, or that God could release us from it if he will. In this we are quite mistaken. Judgment is not a creation of theology, nor of psychology, nor even a product of the imagination. Judging is a process of thought and is innate in any being who has the right of choice, or who thinks he has. No one can escape the process, nor its results.

Judgment is an identification or comparison and a declaration. Is ice cold or hot? Is an act right or wrong? Is a belief theistic or atheistic? Each answer depends upon what the standard is. You compare the thing in mind with the standard. An act is honest or dishonest according to your standard of honesty. Slavery is right or wrong according to the standard. Standards vary. Sixty years ago men were proving from the Bible that slavery was right and other men were proving from the same book that slavery was wrong. They could not both be right. Now they all agree that it is wrong, and most of them agree that it was wrong all the time they were trying to prove it was right. The interpretation of the Bible in regard to slavery has changed, the standard has varied.

**Knowledge of Standards.**—A knowledge of standards is essential in every process of judging and is essential to the one who is to judge and also to the one who is to be judged. One cannot judge how many feet long a stick of timber is unless he knows how long a foot is. One cannot judge whether or not one does a fair day's work unless he has knowledge of what constitutes a day's work. These standards are concepts which are arrived at thru the process of judging.

**The Raw Material of Judging.**—As we have already seen the interpreting and relating of sensations provides the raw material out of which percepts are formed, and the relating and interpreting of percepts provides the material of which con-

cepts are formed. In much the same way concepts are the raw material out of which judgments are formed. There is a simple judging process in comparing and relating percepts, but the judging process comes to its fulness in dealing with concepts.

Judgment compares two concepts and declares whether or not they agree. One has in mind a concept of an orange and then decides whether or not the object he sees is an orange. It is always a choice between two and only two alternatives at one time. In perception there may be two or more elements and there may be several or many elements entering into the formation of the concept, but not so with the judgment. It is what Titchener calls "the yes-no consciousness." The thing is or it is not. Not only must the two concepts be held in the mind at the same time but a declaration must be made about them. They must be logically related.

As one's ability to form concepts depends upon his stock of percepts, so his ability to form judgments depends upon his stock of concepts. Other things being equal the one with the most facts at his command is the more intelligent. There is no "corner" on facts. There is no limit to the number of concepts one may form except his own determination. One can continually acquire facts and form new concepts.

Many judgments are false because of a failure to get all the facts. We do not observe extensively enough nor accurately enough. Often we think too much and observe too little. We do a good deal of thinking but do it with only a part of the facts in mind. We should aim to observe widely and then think accurately. Many judgments are false for us because we have taken them from others. It is not enough for one to think as others think. If that were so, then there can be no progress for the race. It is because men have arisen who do not think as others do, but who think far ahead of the great mass that

any advance is possible. This is true in religion, politics, science, business, everywhere and in every line. Jesus, Paul, Socrates, Copernicus, Galileo, Newton, Harvey, Darwin, Rousseau, Jefferson, Lincoln, De Lesseps, Langley and scores of others have that way ahead of the group and often reached conclusions contrary to it, which it later accepted.

**Training the Judgment.**—We should not ask others to accept our conclusions, neither should we accept the judgments of others unless we familiarize ourselves with the process through which they reached their conclusion. If we know the facts involved and the method pursued we are in a position to test the conclusion ourselves. A lack of either of these makes one narrow, and gives rise to prejudice and bias.

Judging cannot be taught; it must be practiced. Every person seeks an honest judgment and everyone believes his judgments are true, yet often they are false. The wise man seeks to have his judgments tested by others. He seeks honest criticism. The unwise man does not want criticism, and is seldom willing to profit by the experience of others in judging. Practice makes perfect in judging as in anything else. The finest result of a trained mind is the ability to judge accurately.

Judging is a process of comparison and in its more formal application deals with the comparison and relation of concepts. "Judging means inquiry; inquiry means doubt; doubt means conflicting opinions." Judgment is all the time seeking discoveries among unrelated concepts. The progress of the world has been due to relating concepts that formerly seemed to have no common elements. All inventions and discoveries have been due to the same process. Sometimes these discoveries have been accidental, but in most cases men have been searching for these relationships and often after years of search have been rewarded with success.

It is said that the streets of Philadelphia were paved with

anthracite until 1803. Then one day a house caught fire and burned down and with it part of the walk running to the street. This walk was made of anthracite. The people then discovered that there was a great amount of heat stored in those black rocks. Whether or not the story is true, it is true that man in some way came to know that hard coal could be used for fuel. Man needed heat and there was the heat in the anthracite, but no one had been able to discover the common element and adapt it to use.

Some thirty-five years ago the business men of Niagara Falls set themselves at the task of discovering some way of using the enormous power of the rapids above the falls. There was great need of power on the entire Niagara frontier and there was that enormous power going to waste. Could not some way be found by which that power could be harnessed and made to meet the needs of the people? After some years of effort there was found a way. Turbines were installed and connected to electric generators and by means of high power lines the Niagara power is now carried for hundreds of miles to shops, factories, and railways. There was nothing really new in the plan. It involved the discovery and relating of what had before been undiscovered and unrelated. That was an exercise of judgment.

Men for years had been familiar with revolving metal in both sheet and solid form. All metallic machinery involved the process. Men had for years been familiar with the horse-shoe magnet, but one day Michael Faraday revolved a piece of sheet metal between the poles of a magnet and as a result the transportation and artificial lighting of the world has been revolutionized. Today the electric generator and its companion, the electric motor, are serving millions because someone discovered a relationship between concepts that seemed to have no relation.

Who would think that trees are made of newspapers? Or to state it differently, who would have thought a few years ago that newspapers could be made of trees? There was in paper and in trees a common element that would help form a new concept when properly related. The discovery of cellulose in wood and its identification with the same material in paper has made possible the building up of the great paper industry.

Discoveries are being made all the time. New relations are being found, and new concepts set up. Who is going to make them in your business? Do you realize that no matter what your business is there are some improvements to be made thru some such discoveries, that there are undiscovered relationships in the material and in the methods used and that someone is bound to discover? Are you waiting for someone else to make the discovery? Why do you not set yourself to make it? Why wait for someone else?

You want to develop your intellect to its highest. That can be done by using it. The best place to use it to its full capacity is in your everyday task.

Any man or boy in any industry who has been at his work long enough to master it knows more about his part of it than any one else connected with the business. If improvements are to be made, he is the logical one to make them. No one else has so fine an opportunity to discover unrelated concepts in your job as you have. Are improvements to be made in the machine you use? You make them. Are improved methods or shortened processes to be discovered and installed? You discover and install them. If a better man than you were to take your place what would he do that you are not doing? When you have answered that question, immediately begin to do those things yourself. By doing all that the better man could do one makes himself equal to the better man.

Many of these discoveries are made by accident, but

almost every discovery is made while one is searching for something. He may not find what he is looking for but he is searching. His mind is awake, alert. Columbus was searching for a route to India; he did not find it, but he discovered something.

This all has a bearing on psychology, because the increasing number of concepts is the measure of our mental growth. It is not enough for one to do his work well today. No one gets real satisfaction from just doing well; he must do it the very best possible. Then he finds joy and happiness, because one can never do his very best without mental growth, and it is growth that brings happiness. One must be bigger than his job; must grow faster than his job; or he will soon be too small for the job. It means that whatever your place in the world may be, whether mining or farming, manufacturing or selling, preaching or teaching, you must be able to relate all your experience and all of your thinking to your work. Every new concept must somehow be related to the task. Every book you read, every course you study must somehow be applied. One who studies psychology and does not relate it to his everyday activities is like one who has money but does not invest it.

— Do you want to succeed? Then you must do. In order to do you must know. One's power to do depends upon his ability to know. You can know more today than you knew yesterday. You can know more tomorrow than you know today and so on as long as normal life continues.

— It depends upon your determination. Have you decided to know more? Then all the powers of the universe are at your command. You are master.

It matters not how strait the gate,  
How charged with punishment the scroll  
I am the master of my fate;  
I am the captain of my soul,

## CHAPTER IV

### THE WORLD OF ASSOCIATION

MOST philosophers of the seventeenth and eighteenth centuries thought that man was the product of environment and education. They believed that all men were born equal but later became unequal on account of unequal opportunities. Descartes was one of these. He says: "Good sense is of all things among men the most equally distributed . . . the diversity of our opinions does not arise from some being endowed with a larger share of reason than others, but solely that we conduct our thoughts along different ways and do not fix our attention on the same objects."

The cry of the French Revolution of "liberty, equality, fraternity" was based on a similar idea. The Declaration of Independence reflected the spirit of that time when it was held to be self-evident "that all men are created free and equal." The idea of the equality of men has always been one of the fundamentals of democracy. Upon that belief has been founded systems of education, government, and theology which have been carried over into our own day, but the study of psychology has made it perfectly plain that all men are not created equal, that no two nervous systems are alike, that the same environment and education will not always produce the same quality of mind.

There is such a thing as inherent ability or capacity and there is such a thing as a lack of both and no environment and no system of education can make up for the lack. Psycho-

logical tests of various kinds, and especially the Army Intelligence Tests, have made clear what many had come to realize in a general way. The Army tests were given to 1,735,000 men who were taken from all walks and stations of life and who represent fairly well a vertical section of the American people. According to these tests there are in America about 15 millions of persons who can be classed as "A" and "B" in mental ability. The remaining 85 millions, or a few more, fall into groups below these two classes. So far as other peoples go they do not rank above us either in grades or in the percentage of population in the grades.

This might seem to have a tendency to destroy our faith in the importance of education and environment. It no doubt comes as a severe shock to those who have thot that education is a panacea for all the ills of our civilization but the facts will do us good if we face them squarely and try to adjust ourselves to them.

When we begin to inquire into the cause for this inequality we find that one of the reasons is the fact that the physical machine that we call the body does not function equally well in all individuals. All human bodies do not react with the same rapidity and accuracy. We all know some persons who are very quick in all their movements and others who are very slow. We know others who see and hear accurately and others who do not, others who interpret quickly and accurately and others who do not. Some can see thru a complex problem and others cannot. Some learn complex processes and perform them with skill and others can never learn the process so as to perform it with any degree of proficiency. These differences depend largely upon the special senses and the condition of the brain, especially the cortex. Two persons may receive similar sensations at the same time. The nervous sys-

tem of one transmits readily and accurately what it has received. It is promptly interpreted and the appropriate action determined upon and the action performed while the other person is still "thinking about it."

**Reaction Time.**—The time required from the receiving of the sensation to the completion of the action is called reaction time. There are many ways of testing persons to learn how quickly they react to various stimuli. These tests not only indicate the time but they also furnish a clue to one's adaptability to the work in hand. Without some tests there is much loss of time and energy. By the use of tests instead of the old "cut and try" method, the unfit as well as the fit may be discovered at once. It is not enough to know one is quick but we want to know how quick.

**Elements Involved.**—There are several elements that enter into the process which runs as follows:

1. The time required by the sensory nerves in transmitting the stimulus to the appropriate brain center.
2. The time required by the brain, or the mind, in perceiving or interpreting the stimulus after it is registered in the cortex, or as we may say, breaking over or thru the synapses in the spinal cord or brain.
3. The time required in issuing a motor order.
4. The time required by the motor nerve in transmitting the command to the muscle to produce action.

The first and fourth are purely physiological times. The second and third are more largely mental, or psychological times. It has been established that the nerves transmit sensations at the speed of about 370 feet a second. The mental time or the breaking thru the synapse is very much slower. The average time for the four parts of the process is from 1-10th to 1-5th of a second.

**Nerve Fibers.**—The white mass of the interior of the brain is composed of fibers of which there are three sets, or groups.

1. Those reaching from the cortex to the various internal organs of the body, and to the eyes, ears, nose, tongue, etc.
2. Those that run from one half of the brain to the other half, enabling both halves to function together.
3. Those that run from one area of the cortex to another.

These are so numerous that every part of the cortex is connected with every other part.

**Association Areas.**—We have referred in a previous chapter to the association areas and the association centers. Herrick says the association areas are the most important part of the human cerebral cortex. These parts of the human brain are very much enlarged in comparison with those of the anthropoid apes. In the apes the projection areas are fully as well developed as in man, but not so in the association areas. The smaller brain weight of the ape is due largely to the lack of development of the association centers. The same is true in regard to humans. Those of lower mentality have undeveloped association areas. The number of brain cells developed nearly double by the end of the fourteenth year. No new cells are created but those present develop. By the end of the fifteenth year the *volume* of cells is about 125 times what it was at birth and in the next fifteen years increases to 150 times the volume at birth. The cells constitute a very small part of the total brain and they may increase in size many times and not greatly affect the size or weight of the brain. The size of the head is not a true index of the size of the brain.

**Frontal Association Areas.**—The frontal association areas are the last to develop and the first to disintegrate. Under

the influence of alcohol and of fevers the higher powers of the mind, which means the higher powers to associate, are the first to disappear. A study of the history of the race indicates that the older the faculty the more nearly universal it will be and in the "break-down" the last power acquired will be the first to go. It requires a long time to stabilize a power in the nervous system of the race. Insanity is the breaking down of recently acquired racial powers.

**Color Sense.**—The color sense appears in the child at the age of three or four. It appeared in the race about three or four hundred thousand years ago. Color seldom appears in dreams and when it does it is usually the color red. Red was the first color known, or identified by man and ultra-violet the latest. In sleep or in delirium these later acquirements disappear first. The same is true of the musical sense. The real musical sense appears at about fifteen years of age. Only about 50 percent of the race have any musical sense. About three or four in one hundred thousand have any *real* musical sense. The musical sense is almost never retained in dreams and never in insanity, not even by musicians. The higher association complexes are the first to break because they are the latest to be acquired by the race, and in the case of many individuals have not yet been acquired.

**Mental Growth.**—Mental attainments depend upon the development of the association areas which are located, according to Flechsig, as follows:

1. In the frontal region.
2. Between the kinesthetic and optical centers.
3. Between the optical and auditory centers.

**Age of Development.**—The great association centers begin to develop at about twelve years of age, or at the beginning of puberty. The upper limit of feeble-mindedness is about

twelve years. This accounts for the inability of feeble-minded to associate. Children under twelve and feeble-minded persons do not associate as well as normal adults do. They do not have the brain development necessary, and hence, not having the tools cannot use them. They are able to make only the simplest classifications and associations. The reason why some persons have no musical sense, no artistic sense, or no moral sense is because the association centers which relate the various impressions, the interpretation of which makes these "senses," are still undeveloped.

**World of Associations.**—We live in a world of associations. Think of anything you will. In a moment you will be thinking of something else and a moment later you will be thinking of something different still. Think of the school you attended and you will think of the teacher, of the chums of your school days, then of the trees that grew in the school yard, of the games you used to play. Then your mind "wanders" to the successes of your former friends, and so forth. Thinking of anything makes us think of other things which are in some way connected with it.

All ideas have certain definite associations with other ideas and they tend to come up in consciousness in groups. Facts are of no value in and of themselves. It is only as they are related to other facts that they serve us. That is the only way they exist. Things in space and events in time do not exist alone but are always a part of a larger group or of some more complex process. Facts have relations like the members of a family. Some are very near relations, others more distant like third and fourth cousins.

One of the first things we ask about a man is in regard to his relations. When we find out that he is the son of Bill Jones or of the Hon. Welkin Ring we begin to be at ease. Hereafter when we think of the Hon. Welkin Ring we will

think of this man. That is, they will be associated in our mind because they are related in the family.

**An Idea Does Not Appear Without Reason.**—An idea never appears in consciousness unless there is a definite reason why it should. We often hear persons speak of thots “popping” into their minds as tho they came from nowhere without cause. This is not the case. In many instances we can trace back connections from what we were thinking about to the ideas which seemed to come without cause. In so many instances has this been true that psychologists are convinced that no idea comes into consciousness without being called directly or indirectly. We shall say more about this when we discuss the subconscious.

**What is Association?**—Association is the tendency of the mind to recreate a previous experience when any element of that experience appears in consciousness. It depends upon the fact that experiences are tied together and that the neuron system must be able to respond to stimuli. Both of these are essential. If either is lacking the association will be lacking, weak, or incomplete. A normal child lacks experience but he has the potentiality. He cannot respond now but he will be able to later on. A feeble-minded person has the experience but he does not have the potentiality. He cannot respond now and in all likelihood never can. We may say that brain plus experience equals success in associating and that experience minus brain equals failure to associate.

**The Normal Process.**—The simple processes of association are carried on by all normal neuron systems. When we see an object and hear a sound at the same time we *associate* them and when later we hear the sound we at once “see” the object. We associate the impressions received thru one sense with those received thru another sense just as readily as we do different impressions received thru the same sense. This

is called the conditioned reflex, and leads often to substituting coincidences for causes, as in Rostand's *Chanticleer*, in which it is believed that his crowing caused the sun to rise, because the rising always had followed his crowing.

**Cause of Association.**—The higher, or more complex, associations are those to be caused by blocking off or damming up the stream of nervous energy in such a way that it cannot follow the old path or channel. The energy seeks a new outlet and in so doing overflows into the great association areas. It seems to act like a stream flowing thru nearly level ground. Any damming of the stream causes the water to rise and very slowly but very surely to seek other outlets or channels. Sometimes the change of channel may be due to an increase of water, in which case the stream, because of its increased volume, sweeps away the little curves and crooks which it followed, so naturally in ordinary times. This overflow may cause a permanent change in the channel while only streamlets follow the old line. So with association, the blocking of the energy may cause an overflow into new channels, and also, under the influence of great fear, anger, or any other deep emotion the old neuron paths may be almost completely swept away and new associations set up, leaving only "streamlets" flowing thru the old channels. Any blocking such as fear, curiosity, hesitancy, or the discovery of a new truth may cause the nerve energy to overflow into new channels and form new neuron patterns. As a result new associations may be formed which are much stronger than the old ones.

Association results because neuron patterns or processes follow a certain order. Two or more pathways have been connected and in some way become "fixed" so that they are more or less permanent. When one is disturbed the other is also. It is like ringing a telephone on a party line. All the bells ring at once. They are all associated. Each idea has its own

system of cells, nerves, or pathways. Stimulate any one and the idea results, or arouse the idea and the pathway is stimulated. The mental process and the physiological process in the cortex are closely connected. We associate because of the structure of the brain upon which all mental processes, so far as we know, depend.

**Past and Present.**—Association supplements present experience with reproductions from past experiences. If one has been burned, consciousness of pain occurs when fire is seen. Pleasure is felt by a hungry person when food is seen or even thot of. The soldier hears the whiz of a shell and “ducks.” One hears an auto horn honk and “sees” the car approaching without even looking in its direction. In each instance some element from the past experience is added to what the present holds. The richer one’s past experiences, the more will be added. If one is a student of history, what a wealth of associations arise when one speaks of the reforms of the Gracchi. If one has visited Oxford University, what pleasure is experienced when reference is made to Trinity, Christ’s, Magdalen, Keble college, etc. The lack of experience indicates a poverty of association that is often painful as well as amusing. The story is told of an Indiana couple, a brother and sister, both unmarried, who had lived together and labored hard for years and just before the World War decided they would visit Europe and see something of the world before they got so old they could not. They visited western Europe and went down into Italy. One morning at breakfast in Florence they fell in with a well informed American to whom they began relating their experiences and their delights at what they had seen. He asked several questions about what they had seen, discussed literature, history, etc., and finally asked what they thot of Omar Khayyam. The brother replied that they had not seen it yet but were going to the next day. After breakfast the

sister said, "James, you make me tired with your putting on airs." James replied, "What's the matter now, Jane?" She replied, "You talk about Omar Khayyam as tho it is a building or an art gallery or something to be seen, when everybody knows it's a cheese." Omar Khayyam did not add much to their experience.

**Laws of Association—Contiguity.**—There are two ways in which we associate things and events. The first is association by contiguity, or as it is often called mechanical association. Do you know why they placed B next to A in the alphabet? Why did they not put it just before Z? Why did our teachers not begin by teaching us the letter Z first, then Y, X, W, etc.? There is no particular reason except that the letters were taught them in the order in which they taught them to us. Of course there is nothing about A that suggests B. We just have to learn that B follows A. There is no way of reasoning it out.

Things that arbitrarily come together in consciousness, however unlike they may be and which are somehow so related that when we think of one we think of the other, are said to be associated by contiguity.

Committing poetry to memory is association by contiguity. Even tho we see the pictures described, the pictures themselves are arbitrarily associated and have to be so remembered. We just have to remember that a certain picture comes before another and having learned them in that order, we find it much easier to repeat them forward than it would be to name the pictures in the reverse order for the same reason that we can name the letter following H in the alphabet more quickly than we can the one preceding it. Read the following verses and note the order of the pictures and then commit the verses to memory and note carefully how you associate the various items referred to:

## THE SHIPS

One ship drives east, and another drives west,  
With the self-same winds that blow.  
'Tis the set of the sails, and not the gales  
Which tells us the way they go.

Like the waves of the sea are the ways of fate  
As we voyage along thru life.  
'Tis the set of the soul which decides its goal  
And not the calm or the strife.

—ELLA WHEELER WILCOX.

Association by contiguity is really at the basis of all association. It is based upon the fact that the stimuli are in consciousness at the same time. Contiguity of experience gives rise to association. A particular element in the new pattern is associated with others having a similar element of time. The elements are actually together in mind.

We may never actually see things together but we see or hear the names together. I think of London, Paris, Berne together, not because I ever saw them together but because they were cities visited on a certain European trip. I associate them also because they are capital cities. They are in mind together under both of these heads. We think of Alexander the Great and Napoleon at the same time, altho they lived centuries apart, as readily as tho we saw them walking down Fifth Avenue together on Easter morning.

Children and feeble-minded associate almost entirely by contiguity. Time and place are the most important things in the way of grouping for them. Children do not discover likenesses as readily as they will later. We do not associate events by the time of their occurrence so much as by the time that we think about them.

**Similarity.**—The other way of associating is by similarity, or, as it is sometimes called, logical association. It depends, not upon time or place so much as it does upon the inner

relations of things and events. There must be some point of identity between the things and events associated. We associate chess and checkers not alone because they are games, nor because they are played somewhat alike, but because they are played on the same kind of a board. We associate billiards and pool because they are played with balls and cues on similar tables.

Association by similarity can only occur when the nervous energy overflows the simple perceptive patterns into the great association areas. We do not begin to seek for relations of cause and effect, genus and species, law and example, means and ends, premise and conclusion, likeness and unlikeness, etc., until we have passed the age of about twelve years, or in other words until the great association areas begin to develop. Similarity requires very much more elaborate neuron patterns than does contiguity and unless these patterns are developed wide association is not possible.

**Likeness and Difference.**—We associate or group by likenesses and differences. We group people by their likes and dislikes, by whether they agree with us or not. None of these groups agree in all points but they have one outstanding point of agreement. All men are not alike. All Odd Fellows are not odd. All ministers are not alike, yet there is a characteristic of ministers because of their views, their training, their calling, which lets us associate them. So with the other groups. There is enough in occupation, profession, trade, to tie men together in groups. It is the same when we deal with material qualities of objects as it is when we deal with personalities.

**Need of Wide Association.**—It is quite necessary if one is to make the best use of his powers that he make wide associations. He cannot *know* unless he does associate widely. What I mean may be illustrated by the following. One is

asked if he knows Mr. A. He replies that he does, that he and Mr. A are both members of the Lawyers' Club. Another knows him as a member of the Presbyterian Church, another as a member of the Masonic fraternity, still another as a member of the Democratic County committee. None of these know him in more than the one relation. None of them know him in the home where he appears as husband and father. They do not associate Mr. A with enough groups to really know him. To know Mr. A one must be able to associate him with all of these and still other groups.

One may know that iron rusts and not associate the fact with the science of chemistry. He may know that wet clothes hung on the line dry, but he may never associate the idea with the science of physics. He may know something about the molecule and the atom but he may not associate them in such a way as to tie physics and chemistry into the group of physical sciences with physiography, meteorology, astronomy, etc. One may know a multitude of facts and yet not associate them in such a manner that they throw light on all his problems, and yet it is possible to do that. It is possible to so associate that the facts of physics will throw light on every other physical science. Association by similarity is at the foundation of comparative anatomy, comparative physiology, comparative religion, etc.

One should be on the lookout for new associations, and for opportunities to increase the extent of the old ones. "Old friends are best" is a saying that may be true, but old associations are not always the best. Often as in anger old associations that we thought were completely broken up reappear. In unguarded moments regrettable associations of former days arise in consciousness and before we are aware of it they have found expression in action. This not only indicates that the old associations are still there but also that they are still strong.

Drowning persons often see their whole past life flashed before them in an instant. A sudden accident on land produces the same effect. A great emotion such as fear of drowning rushes thru one's mind on a sort of a "Paul Revere's Ride," disregarding all conventionalities and customs, arousing "every Middlesex hamlet and farm" of the mind to the impending danger, and so one sees all his past, or enough of it to make him feel that nothing has been omitted.

**Power of Association.**—The power of association is almost beyond belief. Ideas are the part of us that do things. Often they do the wrong thing. When they do, it is because of wrong associations that have been established in the mind. We saw in an earlier chapter that the sympathetic nervous system controls all of the vital organs and that impressions made upon the cerebrospinal nervous system would affect the sympathetic system. Impressions in the way of ideas in consciousness will affect the subconsciousness and the subconsciousness will cause the vital organs to function in accordance with the ideas received.

For instance, one once ate sour cherries and drank milk at the same meal and afterwards was ill. He gets the idea that it was the milk and cherries that caused the illness and having associated the illness with milk and cherries he cannot again eat the two together without being sick. He says the cherries soured the milk and that made him sick. If he knew that the hydrochloric acid in the stomach sours every drop of milk as soon as it reaches the stomach whether one eats cherries or not he would have to find another reason for being ill, or more likely he would go on eating cherries and drinking milk and not suffer any ill effects from them.

A man came to me about two years ago who recited an experience with milk and cherries similar to what I have just stated. When he was a boy forty-five years ago he was made

sick he thot by eating milk and cherries together and altho he is very fond of both he has always had to be careful not to eat them together. Whenever he has eaten them together he has been ill. When I explained to him that all milk sours as soon as it reaches the stomach and that it cannot be digested until it sours he replied, "Then what always makes me sick?" I explained that in the first instance his stomach may not have been functioning quite normally and that the eating of cherries and milk may have been the straw that broke the camel's back. They may have been the occasion and not the cause of the illness, but he not knowing any other reason assumed that the cherries and milk were the cause and having set up that association in his consciousness, it had immediately laid hold upon the subconsciousness and whenever he ate the two foods together the subconsciousness upset the action of the stomach and he was ill.

I told him that if he could break up that old association he would no longer suffer any inconvenience from eating the two articles of food together. He was not able to do it. Then I suggested hypnotism, and as the result of one treatment the old association was completely broken up and for two years he has eaten cherries and milk together on numerous occasions without the least discomfort.

**Subconscious.**—As we have already stated in another chapter, the mind is the whole and the consciousness is the part. A number of names are in use in referring to the part of the mind that is not consciousness, but we shall use subconsciousness or the subconscious, remembering that when we speak of the subconscious mind we are referring to that *part* of the mind which is not in consciousness and not to another mind. We have one mind only. It may manifest itself in many ways.

**Subconscious Association.**—The thots of the moment pass into the subconsciousness and there remain until recalled. They pass into the subconsciousness associated in groups. Often we do not know all the elements in the group and only under the influence of hypnosis can we get at some of them.

What we are interested in just now is to see what the subconscious associations result in. For instance I know several persons who have always been a little shy of policemen. Some of them had reason to be, but others could give no reason for the feeling except that as children some of them had been frightened into obeying by being told that the "cop" would get them if they did not. Those threats had settled down into the subconsciousness and at every appearance of a policeman a little wave of emotion was aroused which caused the unpleasant feeling.

In the minds of most persons the abnormal functioning of bodily organs has come to be associated with organic disease. But the psychologist knows that most functional disturbances are caused by the mind thru wrong association and he knows also that the functioning may be made normal by conscious control. The organs misbehave because of wrong association and can be set right by establishing right associations. The trouble is not in the organs of the body but in the mind. This does not say that we have no organs, that there is no matter, that all is mind. It does not go as far as the Christian Scientist and deny all material substance or at least call material things errors. Someone has said that a Christian Scientist may deny all materiality but he always knows the right change for a five dollar bill. The Christian Scientist can go no further than to help secure conscious control of organic functioning and he cannot go that far unless he follows exactly the laws of mental operation.

The body functions according to groups of associated

ideas. With every idea there is associated an emotion. The seat of the emotions is in the sympathetic nervous system. One can, to a surprising degree, control his emotions and so control the ideas and his actions, conscious and subconscious. We shall see more of this later on.

Some of the groups that are wrongly associated are, for instance, the need of eight hours sleep, and that brain work is very fatiguing. So strongly fixed in our minds is the idea that one must sleep at least eight hours, that if for any reason we are awake for an hour or two during the night because of "restlessness" we are very much worried.

No one ever went crazy because of lying awake. One may have gone crazy over *worrying about lying awake* nights. One does not need eight hours *sleep*. He needs eight hours *rest*, which he can secure without sleep if he will lie quietly with all voluntary muscles relaxed. But so firmly fixed is the idea that it is dangerous to lie awake that if we cannot sleep we "roll and toss and worry" and the next morning take pleasure in telling how many times we heard the clock strike during the night. We never slept a wink from one-thirty to five. Suppose we didn't. Suppose you say to yourself, "I lie awake half the night lately. Now I am going to go it one better and stay awake all night." You will have the hardest time to keep awake you have ever had. The one time when you really find it hard to sleep is when you go to bed. "I cannot sleep" has become associated with *bed* and the subconscious mind lays hold on the suggestion and keeps you awake.

In the same way one has difficulty in awaking. One has to be called every morning, either by an alarm clock or by another member of the household. I have had persons declare to me that they just could not wake on time in the morning. I have declared to my psychology classes for years that anyone can awaken at any hour of the night he wishes, that the only

reason one has come to feel that he cannot waken is because he has set up an associated group, two elements of which are, "I cannot waken" and "six o'clock." If one will form another associated group composed of "I can waken" and "six o'clock," he will have no difficulty in waking.

In one of the classes which was composed of men and women from the various professions, manufacturing, merchandising, and allied interests, one of the men said he did not believe that it would be possible for him to awaken without being called, that he had formerly used an alarm clock, but that he had gotten so he could not hear that and that for several years his wife had called him every morning, much to his chagrin, but he "just could not wake up."

I asked him what time his wife called him and he said she always called him at six o'clock. I suggested to him that he go home that night and tell his wife that she should not call him again, that he was going to apply psychology to waking, and that to prove it he would awaken her at five o'clock the next morning. He should then go to bed and just before falling to sleep say to himself, "I am going to waken at five o'clock in the morning, *five o'clock*," and then to go to sleep and sleep "like a log" and not with one eye open for fear he would over sleep.

The next Monday evening he came to class and I asked him to report. He said his wife made all sorts of fun of him when he said she need not call him, saying he would sleep until noon if she did not, but to his delight and her surprise he called her at five minutes to five the next morning, and that he had awakened at six o'clock, the time set, every morning during the week. I saw him recently and he said he has not used the alarm clock nor been called during the past two years, and that on several occasions it has been necessary for him to catch an early train out of the city in connection with some of

his business trips and he has never missed one. The old association seems to have been completely broken up. He has really gained self-control. The one who says, "I can" has the battle half won. The one who says, "I cannot" is licked before he starts.

What is true in regard to sleeping and waking is true in regard to the idea of fatigue as a result of brain work. We have been told so often that brain work is so very fatiguing, that our minds are filled with the idea. The association between brain work and fatigue is so strong that anything that we interpret as brain work makes us tired. We expect to get tired and we get tired. Just as the man who ate cherries and drank milk expected to be sick and was until he learned better. It is not the brain work, but the worry that some of us allow to disturb us that fatigues us. Brain work is no more fatiguing than muscular effort, and we recuperate just as quickly from it.

Of course your work is the most wearing, the most tiring, because you think it is. You are going to be fatigued in proportion to what you think the work demands. How sorry we have come to feel for ourselves! But learn the facts about yourself and set up new associations based on facts instead of on fancy. You are stronger, bigger, better than you know. Ask yourself how you came by such ideas as you have been harboring. In most instances you will find that "they say" and or, "everyone knows it," is the authority for your beliefs. Then get behind these and discover the facts and correct your beliefs.

Some of these wrong associations are formed in early childhood, have passed into the subconsciousness and are often forgotten, while the effects of the association remain for years. Several years ago a woman came to me who had suffered for years from fear occasioned by hearing footsteps

behind her on the street. She just could not stand it to have anyone walk behind her, and sometimes it seemed as tho she must either scream or run, but the imaginary spectacle of a woman of forty-five running down the street would restrain her while she would "shake like a leaf." She had finally gotten to the point where she came home from her work "completely exhausted" every night.

A careful questioning of her failed to throw any light on a sufficient cause and hypnotism was suggested. Under hypnosis I was able to get from her a recital of an incident that occurred before she was seven years old and which she had completely forgotten. I told her that when she came out of the hypnosis she would recall all that she had told me, which she did. As soon as she sensed the situation and saw the relation of that early experience to her present fear she began to form a new association and has never been troubled by "hearing footsteps" behind her. She had been treated by physicians for years, but the cause was not organic but functional. Physiologically she was sound, but associationally she was all awry. When I saw her about two years after I had hypnotized her, she said, "What a world of misery I could have been saved if the cause of my trouble could have been discovered thirty years ago."

There are persons who have formed such a strong association between the idea of ships and seasickness that to go on board a ship lying at the pier causes nausea. In fact for years I had similar experiences and to stand on land and watch a ship roll slightly in the harbor would make me sick. Most of us were brot up with the idea of being sea sick if we ever should go upon the water and of course we are sea sick at the first and usually at the last opportunity, although some of us "overcome" it.

We speak of the dignity of labor and yet in the minds of

the great majority of the laboring classes there is the idea, caused by wrong associations, of the *indignity* of labor, and all too often the working man is dissatisfied with his lot because he feels that he is consigned to an undignified activity. He cannot conceive of time or condition when men would "work for the joy of working and none would work for pay." Even many of those who have expatiated upon the dignity of labor are perfectly willing that the other man should do the laboring, and those who have associated all things evil with capital have changed their minds as soon as they have acquired a little capital. That is, they set up new associations.

In both of these groups there is a tendency to associate everything bad with the other group. The capitalist can think of nothing too mean for the laboring man to do, and vice versa. In many cases both find grounds for their suspicions, and until time and effort are given to the breaking up of the old prejudices based upon wrong mental associations and the forming of new associations based upon facts which recognize that the rascal is the exception in the ranks of both capital and labor, there cannot be peace in industry nor in community life. The law of cause and effect applies as well in the field of association as anywhere else.

Suggestions of leaders in both groups find expression later in the actions of their followers and often neither group realizes the origin of its spring of action.

**Dissociation.**—In order that association may be made, dissociation must also be exercised. Something must be rejected, kept out of mind for the time being. Dissociating is rather difficult. Ask a child which is heavier, a pound of feathers or a pound of lead and almost without exception the answer will be, "lead." He cannot dissociate the "lightness" of feathers and have "heavy" left. In the same way people find it difficult to dissociate the idea of impurity from warm

air, and yet analysis shows that warm air is just as pure as cold air. Most of us find it a little difficult to dissociate wings from a bat and see an animal that is not a bird, or the snake-like characteristics from an eel and see a fish.

We meet all things as complexes and not as units and we have to learn to dissociate the different elements and to classify, or associate. The temperers of steel associate a certain color with the temper of the steel, and they must dissociate that color from all other elements in the steel. So also with dyers of silks, wine-tasters, and tea-tasters. Just as we learn to taste the corn starch or the vanilla in ice-cream by dissociating them from the other elements, so these experts referred to do with their tasks.

Association always implies inhibition and discrimination. When an element appears in consciousness there is a tendency to recreate the whole of a former experience. Some of those elements are not wanted and so are inhibited. One is walking along the street and hears the fire engine approaching. The first impulse is to follow the fire engine, but he remembers that he has an appointment to keep and so he inhibits or drives out of his group of associated elements those which would lead him to the fire. Hysterics are those who dissociate many experiences from the common group and who exaggerate those which they associate. These are perverted associations, or obsessions, some element of which is very much exaggerated. Experiences are common where the associated idea and its physiological response have produced exaggerations so strong that functional processes of the organs of the body are disturbed. Prejudice and bias are examples of perverted associations.

The fatigue of marching men will be relieved by martial music. It diverts or inhibits certain ideas and arouses the emotions. Hypnosis reinforces associations or sets up new

ones. However, we must not overlook the fact that there is a continuity of mental processes. There is no point where one mental process ends and another begins. They are as continuous as consciousness itself, and extend in many cases below consciousness.

**Time Required to Form Associations.**—Associations are not formed instantaneously but require considerable time. Practically all of us have had experiences after wrestling with difficult problems and then forgetting them for some time to find that on returning to them the matter has cleared up. Often we read a book, the drift of which we have difficulty in getting, then after several weeks or months we re-read it and find to our great surprise the matter has cleared up considerably. Of course this may be due to a wider experience, but it is due largely to the fact that the association processes have been busy in the subconsciousness of the individual. We all realize that cramming the mind full of facts for an examination does not acquire knowledge that stays with us. We must allow time for associations to be permanently formed. This shows why frequent reviews are necessary. These associations once being formed do become quite permanent. If one has ever learned to ride a bicycle and has thereby associated the various movements in balancing and propelling the wheel he may give up riding for a score of years and then mount the bicycle and ride with as much ease as ever.

**Uncontrolled Associations.**—One can get a fairly accurate idea of a person's ability to associate by naming a word and then let the person name the first word that occurs to him and the next, etc., say for three minutes, not using words connected in sentences. If this test is given to a number of persons there will be a wide variation in the number of words named. The best record will show an average of 1 to 1 1/5

seconds per word and the poorest of  $1\frac{1}{5}$  to  $2\frac{1}{2}$  seconds per word.

Studying the words carefully one will find light thrown upon the experience of the individual. If the word "ice" is mentioned, the words named by one person will be, cold, frozen water, skating, winter sports, ice house, food preservation, etc. Another person will respond with 32 degrees above zero, expansion, etc., running off into the principles of refrigeration, the advantages that come from the ice being lighter than water and so rising to the surface as it freezes, thus saving the life of fish and other inhabitants of the deep.

In a group of a dozen persons such a list of associated words throws a flood of light upon one's interest, education, and experience.

Tests in proof reading show that one man can read 2629 letters in one minute and thirty-two seconds, which indicates that he read one letter in one-twenty-eighth of a second. An unforeseen word will require five-sixths of a second to arouse an associated idea in the mind. It takes twice as long to read words that have no connection as it does to read words in sentences. It requires one-fourth of a second per word to read unconnected words and one-eighth of a second to read the connected ones. All normal persons recognize colors and pictures in slightly less time than they do words, but they require a longer time to name the color.

**Familiarity and Associations.**—The speed of time required for association may be increased by familiarizing one's-self with the material. Two men, both of whom know equally well that 6 and 5 equal 11 and one of whom works with figures constantly and the other with literature, cannot respond equally quickly when asked how many 6 and 5 are. The one who follows a literary pursuit will, other things being equal, require one-tenth of a second longer to answer the question.

On the other hand, while both of these men know equally well that Tennyson is a poet, the one who works with figures requires a longer time to state the fact.

**The Demands.**—There are certain qualities demanded of all persons who seek employment with the idea of succeeding. Some positions require a greater emphasis upon one, some upon another, but they are all demanded. These three are accuracy, skill, and speed, and they are all based upon association. A person who is not accurate is not worth much anywhere and unless one has formed the habit of accurate association, to be compelled to give close attention to accuracy is a wearing experience. The tendency that we often come across of "that is near enough" indicates a tendency to inaccurate observation and association with which industry and science today have no patience. Accuracy is essential. Then if one expects to succeed let him determine, or have someone determine for him if he is in doubt, whether or not he is accurate. Accuracy is not only an essential, it is the first essential. The thing must be right. Parts of the machine must be accurately made. They must be accurately adjusted. The mathematical computation must be correct.

When accuracy is assured the next demand is for skill. Skill in the performance. In order to be skilful the muscles must be trained thru wide and careful associations. These associations require considerable time and they must become second nature. New muscular habits cannot be acquired in a day. The acquiring of muscular habits is to quite a degree a subconscious process. When one is going up stairs and expects to find another step at the top he raises his foot to meet it and finds it is not there. His whole muscular system is disturbed. Somehow subconsciously the muscles had gotten themselves ready to meet that uplift of the body to the next step. One sees what looks like a 50 pound dumb bell lying on

the gymnasium floor. He stoops to lift it. Subconsciously the muscles of the body tighten. He takes hold of the dumb bell and with all of that energy ready to be released and to his great surprise finds it is made of paper. Skill arises from a coordination of the mental and muscular reaction so that the task may be done easily as well as accurately. These two, accuracy and skill, are essential.

In addition to these speed is needed, but speed without accuracy or skill is a liability. One may be as accurate and as skilful as the occasion demands, but if it takes him forever and a day to get the work done, industry cannot afford to wait for him. On the other hand, if the thing is done speedily but is inaccurate the results are too expensive for industry to meet.

These three things, accuracy, skill, speed, ought to become as far as possible a second nature to one. In so far as they do there will need to be little expense in the supervision of one's task, and in industry we are beginning to discover that the money paid for supervision of a man's task cannot be paid to him in wages.

**The Three Phase Aspect.**—As Munsterberg has pointed out, there is a three phase aspect in every experience. There is the aspect of *knowing*, having information about the task so that we may readily associate all the important elements of our experience at the time of need. Do you have all the information that it is possible to get about your work? If not, then there is someone better equipped to take your place and somebody is going to take it. There is an opportunity for you to increase your capital stock, which is your ability to dispense service. You have ability to sell. The greater your ability the greater the return. Tests of various kinds may be applied to help you to discover just how much you know about the task.

Another aspect of experience, which has up to recent times been very largely overlooked, is that of *feeling*. That raises the question of personal and social satisfaction which comes to the worker as the result of a well finished piece of work. Are you employing men and women? How much concern have you as to whether or not they are happy with the work? Are you employed by someone else? How much concern has your employer with regard to your social and personal satisfaction? Yet we know that one cannot succeed anywhere unless his best efforts are enlisted, and no one in modern life can succeed to the best unless he is able to enlist the efforts of other men to help him accomplish the things he has thot out, and men will never put their best efforts into anything that does not create a personal satisfaction. In industry we find a turnover of five times annually, that is, five times as many men have to be employed in the skilled operations in order to keep the working force intact. It has been estimated that it costs \$40.00 every time a man is discharged and another employed. Some day thru the understanding of men as well as of processes, employers will come to understand that the working man himself has hopes, desires, and aspirations which he must be able to satisfy in the industry in which he is employed or he will remain a liability to the industry. But in all too many cases while both employees and employers have hopes and desires and ambitions, neither one knows those of the other group.

Andrew Carnegie said the way he was able to make his millions was not because he knew so much but because he could interest men who knew so much more than he did and then keep them interested while they worked for him. The touch of this very thing, a personal satisfaction, must come from the effort that you put into your work.

There is also the aspect of *doing*, which again raises the

question of skill and of experience. How much technical skill have you? Are you a paper hanger? How good a one? Are you a preacher? How good a one are you? Are you an advertising man? How skilful? How well qualified to do or carry on the essentials of your vocation?

These three things, the aspect of knowing, the aspect of feeling, the aspect of doing, are essential. The degree to which one measures up depends on how well and how widely he has learned to associate.

In spite of all that has been said about tests, no one knows us quite so well as we know ourselves, or at least as it is possible for us to know ourselves. Let us then, while it is possible, become so acquainted with ourselves that we know wherein we need special training and then get it. Let us form associations that have, as far as possible, a logical basis. If we are in industry, let us be able to associate the process in which we are engaged with all the processes of the department, and that department with all the other departments of the business. If we are teachers of arithmetic, let us be able to associate arithmetic with the entire field of mathematics. If we are students, let us continually seek for the discovery of relationships so that we may really make ourselves master of the field in which we seek to live.

## CHAPTER V

### MEMORY

IN the preceding chapters we have considered the relation of the mind to the body, and how the raw material of sensation is registered and interpreted, resulting in the percept. We have traced the processes thru to the establishment in the mind of the concept. We saw that there were certain centers in the brain that do not connect sensory and motor neurons; that they connect the great association centers which begin to develop in the normal child at about twelve years of age.

You will realize upon a moment's thought that sensations and sense-percepts confine us to the present, the here and now. With these only there would be no yesterday, no past, no history, no biography. Without another quality of the mind the child could never become an adult in mentality.

**Memory.**—Memory enables us to extend our mastery beyond the immediate present. All of our remembered past can be brought before us now. We live again the experiences of former years. We visit again the scenes of our childhood. We live again thru pleasant memories of other days. By means of memory the past is made available for present use. We remember the results of mistakes made in other days and that memory serves to prevent a repetition of the mistake. We learn by experience, but we would not were it not for memory and remembering.

**Memory and Remembering.**—Memory is characteristic of all organic life and is a form of motor activity. It makes

its appearance far down in the field of biology and is found all the way upward. Horses, cows, cats, dogs have memories. All migratory birds as well as others have memories. We often find the birds returning from their southern homes and using again the nest of the former year. Instinct is organic memory. Remembering is a matter of personal consciousness. Memory and remembering release us from the slavery of the present. Remembering is a process of building up associations among our experiences which we wish to retain.

**Good Memory.**—A good memory does not remember everything, but it should remember enough to be of service. It ought to be faithful in retaining, reproducing, recognizing, and replacing experiences. One cannot very well know everything, but each one should be able to remember the facts needed in his field. One should be able to remember all the essentials of his business or profession. He should not forget his social and home relations. He ought to remember to look after his health, not to forget about his intellectual development. A good memory ought to give one a fairly good command of his past experiences, and relate them to the affairs of today so that he does not make unnecessary blunders.

**Poor Memory.**—We frequently hear persons complain of a poor memory, but every memory is good at some things. One always remembers what he really wants to remember. We often “wish” we could remember but we do not really *want* to. How often when we hear a story told someone says, “I wish I could remember stories as he does” and then never think of the stories again until he hears someone telling a story and then he “wishes” he could remember. The poorest memory is good at some things. The merchant never forgets prices of his goods. The chemist remembers the formulas he uses. The physician does not forget his prescriptions. The musician remembers his music. The baseball “fan” knows

and can tell instantly all the details of the records of his favorite players. I never knew a young man to forget the address of his "sweetheart." We remember what we want to remember.

**Forgetting.**—Memory is not like a photographic negative, unchangeable. It is more like a sieve. It lets many things thru. The intervening spaces are often filled in with what is common experience, or by what we judge or wish had happened. Forgetting is of equal importance with remembering. If one remembered and repeated every detail of an experience, he would often make himself a nuisance and a bore. James calls our attention to a selection in Jane Austen's "Emma," which illustrates the tediousness caused by the contiguity of a recital.

"But where could you hear it?" cried Mrs. Bates. "Where could you possibly hear it, Mr. Knightley For it is not five minutes since I received Mrs. Cole's note—no, it cannot be more than five—or at most ten—for I had got my bonnet and spencer on, just ready to come out—I was only gone down to speak to Patty again about the pork—Jane was standing in the passage—were you not, Jane?—for my mother was so afraid that we had not any salting-pan large enough. So I said I would go down and see, and Jane said 'Shall I go down instead? for I think you have a little cold, and Patty had been washing the kitchen.' 'Oh, my dear,' said I—well, and just then came the note."

Some brain records are like a phonograph record. When one begins the selection it plays straight on thru. It cannot make selections. It follows the chronological order. Logic has no place in its reactions. If one interrupts such a brain record, the process must be begun all over again and the whole performance repeated. A verbatim memory is, therefore, often a very serious handicap.

Such details make one very ineffective in mental reactions. Remembering should be selective, dropping out many non-essentials. It should give us a broad perspective, recall the mountain peaks of experience, and yet the ability to recall detail when needed is essential. One speaks of the railroad

trip from New York City to Buffalo. I at once think of Poughkeepsie, Albany, Utica, Syracuse, Rochester, Buffalo, the larger cities on the line, but if further discussion ensues, I will think of the smaller stations between these larger ones until I will have recalled most of them. So a good memory omits many of the details which on occasion it may readily recall.

**Basis of Memory.**—Experience which can be recalled must be preserved somewhere. We have seen that sensory stimuli leave a more or less definite impression in the neurons of the brain. The neurons never forget an experience they have had. Every sense impression and every motor response leaves an impression somewhere. The power of the nervous system to respond to stimuli is the basis of memory. All functions of the nervous system are improved by repetition and if stimuli are repeated frequently enough there results a permanent change in the brain cells. Memory is due to the number and to the persistence of these brain paths. These paths are made thru exercise. It is like making a path thru the underbrush. The first time thru there are left a few broken and down-trodden bushes, but after several trips thru the brush a more or less well marked path results, and those who have occasion to go in that general direction will follow the path. It is easier and pleasanter. So the stimuli of the nerves take the paths of least resistance, and by the continued exercise of these centers tend to make them permanent. The nervous system preserves a record of what has happened to it and tends, on being stimulated, to act as it has acted.

**Brain Change Permanent.**—The brain is changed by these stimuli even tho the interpretations are forgotten. The neurons have been modified as a result of the impressions and so change future stimuli as they pass over the same path. These last impressions must mean something different than they would if they traversed a nerve and reached a neuron

that had not been perviously stimulated. So the records of former stimuli by modifying the effect of later impressions will result in a different interpretation and so result in a change of conduct. Even tho one may forget a past experience, the record is still there to color and influence action.

**Memories or Memory.**—We have spoken of memory as tho it were one, but we do not have a memory. We have memories. The localization of function about which we studied earlier indicates that we do not have a memory, but many memories. As you recall, the association centers in the human brain occupy about two-thirds of the cortex. Definite areas in the cortex perform special tasks. The stimuli effecting the nerves of sight leave a trace in the sight area. A later stimulus may lead to a recall or a remembering of the thing seen without disturbing any other nerve center.

Stimuli effecting the nerves of hearing will produce, so to speak, another memory and so on. So there will be a memory of sight, a memory of hearing, a memory of taste, etc. In fact, there will be as many memories as there are centers in the brain in which impressions are made. These memories are not all equally clear. Visual and auditory feeling are more easily recalled than are those of taste and smell. It is very difficult for one to remember the feeling of hunger or thirst. The emotions are difficult to recall because the distinction between the actual emotion aroused when one is hungry and the ideal emotion aroused when he thinks of being hungry is not very pronounced.

**Types of Memory.**—There are several distinct types of memory, such as, visual, auditive, muscular. The person with a visual memory always sees colors and forms. He must get a good look at whatever he wishes to remember and when he recalls a circumstance, he *sees* each element. Someone refers to a selection in the old school reader. This person says, "I

remember that selection. It began on page 100 near the bottom of the left hand page and ran down thru the next page and finished at the top of page 102." Such a person seldom sees motion in a scene remembered. He sees the morning train on its way to the city, but as he thinks of it, it is not moving but is like a "painted train" seen against the landscape.

One with an auditive memory does not remember so well, how a thing or person looks but he remembers sounds. He cannot recall the details of facial expression of his friends, but he can recall the sound of the voices so distinctly that often he can go to the piano and touch the key that corresponds to the pitch of a friend's voice.

The one with a muscular type of memory sees and remembers motions. He will see in his mind's eye the morning train gliding along in the distance on its way to the city, but will not be sure whether it has six or seven cars. Such a person is interested in movements. He enjoys sleight-of-hand exhibitions and often sees more of the intricate movements of the performer than any of those who are eye-minded or ear-minded.

**Retention.**—In order that one may have a memory of anything there must be *retained* in the brain the effects of an experience. Without retention there could be no possibility of remembering. One cannot recall what is not there. But memory does not deal with raw material of experience, but with the relations of retained ideas. In order that retention may be made as permanent as possible, one should see that the impression is strong. The artist will visualize a subject at one sitting. Most of us would need a dozen and then perhaps could not tell the color of the eyes of the subject.

Deep impression is essential for retention. The impression made upon us by words is often more lasting than seeing

the object itself. The impression made by the simplest flower upon Wordsworth was probably more lasting than that of the most gorgeous or most delicate upon most people. He says,

To me the meanest flower that grows can give  
Thoughts that do often lie too deep for tears.

There was a deep impression, and a lasting one. Most of us are more impressed with his words than by the "meanest flower that grows."

**Recall.**—If the mind retains and nothing more the material retained would be of no use. It must be where we can get at it. One must be able to *recall*, bring again into consciousness that which has been stored away in the recesses of the mind. Often we know we have certain things in the mind, yet we cannot get hold of them. Recalling is not like the power to run, to lift, to see. It does not come at the command of the will. It is more like a combination lock. One may want ever so much to get into the safe. He may rattle the door and go thru all sorts of antics, but the door does not open until someone works the combination according to the "set." One must get hold of the right combination, or association in order to get into the mind and find the fact wanted.

**Recognition.**—The image must not only be recalled but it must be *recognized*. There must be a feeling that this has occurred or been seen before. It must be recognized as part of *my* past. There must be a feeling of familiarity, or at least a feeling of the absence of strangeness. This is indicated by feeling at ease when the image appears.

**Replace.**—The image must be retained, recalled, recognized, and replaced before the act of remembering is complete. One must know the circumstances under which the experience appeared. He must be able to live the incident over again, must see the original setting.

We often find ourselves with an image in mind and are at a loss to replace it. Or we meet a person and are sure we have an image of the person correctly in mind, but we cannot tell where we have previously seen him. The mind will keep on trying to replace the former experience and often when we least expect it, the matter is cleared up and we are at ease about the matter.

About four years ago I was introduced to a man in New York. I remarked that I was sure I had seen him before, but he had no recollection of having ever seen me. The matter rather bothered me for two or three days. Every little while the question of where I had seen him would come into my mind. One evening three or four days after being introduced to him I was riding downtown in the elevated train. I was reading a newspaper at the time when suddenly I saw in my mind a little railroad station in the south of France and a number of passengers waiting, and there among them I saw this man and two elderly ladies with him. The next time I saw him I asked him if he were not in the south of France in the early part of the Great War. He replied that he was, and remembered being at the station where I had seen him, altho he had not seen me at the time. When we come to deal more definitely with the subconsciousness we shall see more clearly how the *replacing* occurred.

**Intensity.**—One of the factors on which permanence of the impression depends is *intensity*, or vividness. If the incident arouses a large degree of interest and attention, the impression will be well fixed. Feelings have a great deal to do with the intensity. Anger, fear, stage fright, etc., make such an impression upon us that we can never forget them and at the same time prevent almost everything else from making any impression at all upon us. The reason we cannot remember things that happen when we are frightened is because the

mind is not directed to remembering them but is directed toward something that prevents the recording of the impressions.

In this connection we may note that interest always give certain impressions the advantage. They get a right-of-way over the ones in which there is less interest. We may be listening to a speaker and presently he mentions something that has to do with a subject in which we have a special interest. We remember just what he says about that point but often we forget the rest of the address. Or we are interested in the general trend of the argument. We want to see where he is coming out. So because of our interest in that we follow the main line and pay no attention to the details, and so of course, straightway forget them.

We remember certain items or points of an address and forget the connection in which they were employed. We often remember the stories told by a speaker and forget the points they were intended to illustrate.

**Recency.**—Another element in the process that is important is the *recency* of the experience. Other things being equal one remembers what happened this morning, or what happened a week ago better than he remembers what happened several years ago. It is in recognition of this that we cram the mind full of facts just before an examination. A little later we shall see that the principle of recency can be very much abused.

**Frequency.**—The oftener an experience is repeated the more permanently it will become fixed in the mind. The neuron paths become definitely marked out, and associations clearly fixed. The recognition of this principle leads the teacher to plan for regular reviews, and also indicates that if we wish to remember a thing we must repeat, or recall frequently until the matter is definitely and permanently fixed.

**Primacy.**—There is another thing that we ought not to overlook in this connection and that is that first impressions are lasting. The first experience, the first view, the first visit to the city, the first of anything makes a very lasting impression upon the mind of the individual. Because of this special pains should be taken to get the right thing, the right method, the right approach the first time.

The conservation of impression depends, other things being equal, upon the intensity, recency, frequency, and primacy of the experience.

**Time Required.**—We have already come to see that to make the impressions in the neurons permanent requires time, but we have not inquired about the length of time required. Many experiments in memory testing have been made and the time recorded. Ebbinghaus conducted a series of experiments along this line years ago and many others have since, all with about the same results. Ebbinghaus found that to remember seven disconnected words required only one reading. To remember twelve disconnected words required sixteen readings. To remember twenty-four such words required forty-four readings. That is, as the number of things to be remembered is presented in larger groups the number of repetitions is still more increased.

Ebbinghaus found that the ability of the brain to retain these impressions was gradually reduced as time passed. He found that having become able to repeat the disconnected words once and so having them clearly in memory, he could after one hour repeat only one-half of the words. After eight hours he could repeat only one-third of them, and after a month had passed, he could repeat only one-fifth of the disconnected words. This seems quite in accordance with what we might expect. A time exposure makes a better picture than a snap shot, but the permanence of both pictures depends upon the

length of time they are in the fixing bath. One cannot make a good picture from an under exposed or an under developed negative.

**False Memory.**—We all have what we may call false memories. This is particularly true with regard to childhood memories. It is not unusual for parents to recite accounts of incidents in which the child was concerned until in after years the person firmly believes that he remembers the incident of his childhood when in reality he remembers only what has been told him about it. This is a false memory of the incident.

This is true also of many other experiences. As already noted there is always the tendency to think of the incident as it seems it ought to have happened, or as it seems it must have happened, or as we wish it had happened and then for us to remember it that way instead of remembering it as it actually occurred. We notice this particularly where our friends are concerned. We look for extenuating circumstances and finally *remember* the incident with the extenuating circumstances as an essential part of the incident.

**Short Memories.**—Short memories are an advantage under some circumstances. To the traveler with a short memory old scenes are always new. The trip never becomes monotonous. While the one with an accurate memory sees way ahead thru his mind's eye and waits patiently for the end of the journey, his companion sees something new at every turn of the road. But the one with a short memory is unable to *idealize* the scenes, and does not anticipate the beauties and pleasures of the journey as the one who has a clear memory. Most of us have longer memories than we think. None grow so old or so forgetful as "Not to remember where he hid his gold."

**Children's Memories.**—It is quite commonly supposed that children have much better memories than adults. We often hear persons remark that they wish they could remember as

they could when they were children. This is a mere supposition. The normal adult has a much better memory than the normal child. Of course the child's mind is less occupied than that of the adult. It is to his advantage to learn. His curiosity is greater. While the adult has acquired a fairly good stock of memory material and often becomes quite satisfied with it, this does not mean that he *cannot* remember. It simply means that in many cases he *does not* remember. The adult has a better memory than the child because he has greater power of concentration. He has a much wider knowledge, and greater wealth of associations. He has a great many more mental pegs to hang things on. The will to learn and to remember is a most important factor, but even here the adult has the advantage. The adult remembers the things that vitally concern him more easily than the child does those that so vitally concern him.

**Memory Systems.**—My students always ask about memory systems and the value of them. My first criticism of memory systems is the over emphasis they make upon the place of the memory. The same criticism can justly be made by those who have systems to sell for the training of any other power of the mind. One man with a system to sell would make you believe that concentration is the great essential. If you buy his system your troubles will all be over. You will concentrate like the author of the system. Another lays all his emphasis upon the training of the will. You need his system to properly train your will, and so it goes.

Another criticism of those systems is the fact that almost without exception the associations are as illogical and far-fetched as they can well be. There is so much scaffolding that one cannot see the building. Why should I remember a dozen things that have no connection with the thing I want to remem-

ber and then after that still have to remember the thing itself. Why not remember the thing from the outset?

There is one advantage in buying a memory training system. Where one's money is there his heart is also. It arouses interest and attention, and as a result of this greater effort results. The same amount of effort spent in discovering valid relations and logical associations would produce much better results.

Memory training systems simply provide crutches. Crutches are for cripples. The system never enables you to throw away the crutches. If one is a mental cripple he may need crutches, but if he is normal he does not need them.

One of the best systems that has been produced is Loissette's. It was at first sold for \$50.00 and a pledge of secrecy. Today it can be bought for 50 cents and nobody wants it. Much better than "memory system" is an understanding of the fundamental principles of mental operation, and an application of those principles in practise whether it is memory, will, concentration, or what not.

**Intend to Remember.**—The first essential toward fixing anything in memory is the *intention to remember it*, and make that intention habitual. So often we express the wish to remember and yet make no effort to do so. One cannot remember the common occurrences of life without giving them a second thought. Make up your mind that you will remember this or that particular thing and then remember it. You surely will not remember it if you do not decide to do so, except it be an unusual experience. That is, you must charge your memory with the task of preserving the impression, and trust your memory to do it. This implies close enough attention to fix the impression in the cortex of the brain. The material to be remembered should be organized into topics and sub-topics that form the best associations.

**Be Interested.**—You must have an interest in what you wish to remember. You cannot be happy and not like the thing you have to do. Happiness depends upon your discovering an interest in the task, or quitting the task. You do not find an interest in your work? Interest is based upon knowledge. Do you know every element in the procedure of your work. Have you made yourself familiar with all the relationships involved? If you do not have knowledge, you will not have interest, and without interest you will not remember. Every fact has a place. Find that place and remember it. Memory must be supported by intelligence.

**Association.**—To be able to recall well one must establish close connection between what he wishes to recall and something that he often thinks of. The doctor tells the patient to take the medicine “just before meals,” assuming that the patient will not forget meal-time, but the patient must “charge” his mind with the relationship or he will eat his meals as usual and forget to take the medicine.

In order to have a good memory one must associate a fact with as many other facts as possible. All memory improvement rests upon the increasing elaboration of associations. No amount of general culture will increase one’s power of memory. One must bring the connection between facts clearly into consciousness. The more we know of any subject, the more easily we remember facts connected with it. It is rather difficult for one who has never studied algebra to remember the binomial theorem, and for one who has never studied trigonometry to remember the formula for the  $\sin \frac{1}{2}A$ . The reason is that the formula does not “mean” anything to him. The pedagogical principle “From the known to the related unknown” has its basis here. The more one’s knowledge is systematized, the more clearly the relations are seen, the more likely one is to remember. The botanist knows and remembers

thousands of plants because he sees relationships. The more all details fit together, the less effort is required to remember them as details. We saw this to be true when we studied systems of concepts.

**Ability to Recall.**—Perseverance in recalling is a virtue. One needs the instincts of a detective when he searches for clues in the mind. He must get into the habit of searching thru his mind for the clues that will lead to the desired impression. One may order the brain to call up the fact and then go about his usual affairs. By and bye the subconsciousness will produce it, just as a file clerk will bring a letter which has been called for. The subconscious action of the mind is the “silent partner” in the business of conducting mental operations.

**Repetition and Review.**—If one wants a good memory, he must not leave it to chance but give it careful attention by seeing that it has fair chance to handle the materials that we want preserved. One should review often. Practise makes perfect. What are you practising? Are you practising remembering or are you practising regretting that you cannot remember?

One must forget and relearn several times before he is master of any subject. It has been determined that in the matter of reviews, it is better to *recall* than to reread the matter to be remembered, that is, it is better to recall the image than it is to get a new impression. It is better to *think* over what is to be remembered than it is to *read* it over. In reviewing appeal to more than one sense if possible. For this reason it is a good plan to take notes even tho you never look at them afterwards. The very fact of writing makes a double impression. It secures cooperation of arm and hand as well as eyes. Make notes on every book you read and make notes as you review. Do this with your psychology. Review the chapter by *thinking* it over. Do not reread until you find you have lost

the connection. In reviewing, fifteen minutes a day is better than one hundred and five minutes once a week, and yet one must not make the period so short that he does not have time to get into the spirit of the matter. Some minds require much more time than others for this. Find out for yourself what is best for you and then act in accordance with that information. Remember the first repetition contributes more toward the establishing of associations than any later repetition.

Repetition reduces resistance. Long periods produce fatigue. One should not attempt to commit to memory when fatigued, neither should he review. At such times the interest lags, and the attention is easily diverted into other channels, and this tends to break up the former associations.

One should give attention to keeping the brain in fine condition by keeping the blood pure. This will come about thru proper food, drink, rest, and recreation. Low vitality impairs mental activity.

**Exercising Memory.**—Exercising the memory for one thing does not improve it for other things. Exercising the arm does not strengthen the leg. One may remember faces but not names. He may remember telephone numbers and not street addresses. If you have difficulty in remembering names, or associating names with faces, take particular pains when you are introduced to a person to hear his name correctly, and pronounce it at the time. Think how it is spelled. If you have a card in your pocket, take the first opportunity to write the name, look at it once, think how it sounds, throw the card away, and remember the name and the face that belongs with it. Remember, a rule is of no use unless applied.

**Concrete Imagery.**—Try to visualize every thing that can be visualized. See in pictures. If you want to remember a list of words, find some relation between two words that stand next to each other. The shortest association, of course, is between

two adjoining words in the list. Position may be the only element that holds them together in the mind, but make the most of that. Name the list of words. Write a sentence with the word you wish to remember.

**Ideas before Words.**—Try to see in pictures. Then grasp the ideas indicated in the pictures. After that learn the words. A good rule to follow in committing any selection is as follows :

1. Read the selection thru.
2. See the pictures in the order in which they occur.
3. Discover the most logical connections between the successive pictures.
4. Tell the story in your own words.
5. Then learn the author's words.

I often use Bryant's "Ode to a Waterfowl" to illustrate the method of learning a poem. The method works equally well for prose. The poem follows :

#### TO A WATERFOWL

Whither, midst falling dew,  
While glow the heavens with the last steps of day,  
Far, through their rosy depths, dost thou pursue  
Thy solitary way?

Vainly the fowler's eye  
Might mark thy distant flight to do thee wrong,  
As, darkly seen against the crimson sky,  
Thy figure floats along.

Seek'st thou the plashy brink  
Of weedy lake, or marge of river wide,  
Or where the rocking billows rise and sink  
On the chafed ocean-side?

There is a Power whose care  
Teaches thy way along that pathless coast—  
The desert and illimitable air—  
Lone wandering, but not lost.

All day thy wings have fanned,  
At that far height, the cold, thin, atmosphere,

Yet stoop not, weary, to the welcome land,  
Though the dark night is near.

And soon that toil shall end;  
Soon shalt thou find a summer home, and rest,  
And scream among thy fellows; reeds shall bend,  
Soon, o'er thy sheltered nest.

Thou'rt gone, the abyss of heaven  
Hath swallowed up thy form; yet, on my heart  
Deeply has sunk the lesson thou hast given,  
And shall not soon depart.

He who, from zone to zone,  
Guides through the boundless sky thy certain flight,  
In the long way that I must tread alone,  
Will lead my steps aright.

We begin by reading the entire poem thru, and then discuss the order of the pictures presented. The scene is laid at the close of day. The poet and the waterfowl are the centers of interest for us. No one else intrudes upon the scene. The poet asks some questions, makes some observations, and reflects upon the whole situation.

He sees the waterfowl flying high in the air just at the close of day. He thinks what a fine shot that would make for a hunter, but no, the bird is too far away. He wonders where the bird is going, whether to some inland lake, some river bank, or to the seashore. But wherever she is going there is a power that directs the course. He muses on the fact that all day long the bird has flown and not stopped to rest, and remarks that soon she will find a home among others of her kind, build her nest, and rear her young. After thus musing, he looks again and the bird is lost to sight. Then he tells us of the lesson he has learned.

Now we have the series of pictures and the poet's reflections fairly well in mind. Let us read the poem to get the author's language. Let us note the second stanza:

Vainly the fowler's eye  
Might mark thy distant flight to do thee wrong,  
As, darkly seen against the crimson sky,  
Thy figure floats along.

Almost without exception students will use the word "harm" in place of "wrong," but once having had their attention called to the word "wrong" and the poet's use of it to rhyme with "along," they will never again make the error.

We notice another peculiar use, or at least a use that we would not usually make. It is in the third stanza:

Or where the rising billows rise and sink (fall)  
On the chafed ocean-side.

In the next to the last stanza is a transposition that we are apt to overlook. The poet says:

. . . on my heart  
Deeply has sunk the lesson thou hast given.

The direct order is of course:

deeply on     my heart  
Has sunk the lesson thou hast given.

Having gotten these peculiar uses of words by the author in mind, we are now in a position to commit the poem to memory exactly as it stands. Every time we go over it we go clear thru so as to get the series of pictures and reflections completely in mind. It is surprising how few repetitions are necessary to enable 50 percent of a class to repeat the entire poem without a mistake. I mean it is surprising to those who are not familiar with what tasks the memory will deal with successfully. Having become able to repeat the poem correctly once thru, if we will repeat it once a day for a week, and then once a month for three months, we can, at almost a moment's notice repeat it a year after the last repetition. We had our interest aroused, our attention directed, and made up our minds to learn the poem, and the rest was easy.

The same approach does equally well for other things. I have described an imaginary journey to classes of from 90 to 100 men and women. The description running to fifteen hun-

dred or two thousand words, and have found that fully half of the group could stand before the class and repeat the entire journey almost word for word and do it as soon as I finished the description.

I have found men and women both very much surprised to know they could repeat the journey. They thought they had poor memories. We do not know how much our memories can do for us until we give them a good trial. I recall meeting thirty-seven young men one evening. They had been assembled for a particular purpose. While we were waiting for one or two others to arrive, it was suggested that we have a stunt or two. I was asked to suggest one. Upon inquiry I found that there were only two in the group who knew each other. All of the others were strangers to everyone else there. I did not know the names of more than six of them. I suggested that we get acquainted and at the same time have a little memory drill. I inquired for the ones who found it easy to remember names and faces, and finally settled upon one who had difficulty in remembering names.

I told him I would introduce him to every other person present if he would introduce me to them when I had finished. He said he could not remember the names of a half a dozen of them. But I persuaded him to try. I introduced him to each one. I had to ask the names of nearly all, so the young man heard the names spoken twice, once when I inquired for it and again when I introduced the person to him. As I introduced each I asked the young man to remember the name and the face to which it belonged, and to associate them both with something about the individual. It took about ten or twelve minutes to introduce him to the thirty-six. We went immediately to the other end of the line and he began introducing them to me. He made only one error in the thirty-six introductions. He was the most surprised one among the thirty-seven when

he had finished. We can remember anything we *want* to remember. If that young man had cared about remembering permanently the names of the others and had rehearsed the names and faces frequently, he would have had no trouble with them. I presume he forgot them before the next night, because he had no interest in remembering them after the stunt was finished; but if he had been offered \$50.00 to recite the names the next night, he would not have forgotten them.

That was association by contiguity. There is little about a man to indicate that his name is Smith. You just have to remember it, or forget it. The same method applies to remembering figures. I have written a row of as many as thirty-seven figures on the blackboard and then gone over them with the class calling their attention to the figures one by one. When I had finished 20 percent of the members of the class could name the figures correctly, forwards or backwards, begin at the middle and go forwards and backwards alternately.

Here is a list I happen to have that was copied from the board in one of the classes by a stenographer I had present. It contains only 19 figures. There were over 150 persons in that class. I give the stenographic report in order that you may see just how I presented the matter:

If I were to write a row of figures across the blackboard and go over the figures carefully fully half of those present can write the figures on the board again correctly. You look as tho you doubted it, so I will show you.

I am writing this row of figures without paying any attention to them. Even if I did, it would not help you any. Those of you who cannot see the blackboard will remember the figures from hearing me name them. Those who can see will get two impressions, one thru the the ear and the other thru the eye.

I want you to see that the power of association is going to tie these figures together in your mind just as you tie together the name and face of a person.

Let us look at the figures. There are nineteen of them. We shall see them in groups of three or fewer. I will call your attention to them so that you will not overlook any of them. The first one is 3. The next, 8. Those two make 38. The third figure is 7, making with the others 387. The figure following 7 is 4. They make 74, and with the 8, 874.

After the 4 comes 6. That is 46,—746. The next is 8—68, or 468. Now if you want to look back you see we have 387468. After the 8 we find 3—83. Before the 8 is a 6. We cannot overlook that—683. Following the 3 is 5—35, or 835. Then we have 4—54—354. Then 9,—49—549. 0 90—490. 7—07—907. Then 6—76—076. 3—63—763. The next is 2—32—632. Then—28—328. 5—85—285. Then follows 7—57—857. 7—57—857. Following the 7 is 2—72—572 and the last.

How many have written the figures? Let me see the hands? Now, I am going to erase the figures and ask you to rewrite them on the board. There were more than a dozen who stood with eyes closed and named the 19 figures in the exact order in which I had written them. Several with eyes closed named the middle figure, the second at the right of it, the third at the left, etc.

They had no trouble in naming the figures backwards as well as forwards. All I did in the matter was to fix the attention and arouse the interest. I helped them to associate the figures in groups of three, recognizing that each figure would call up the one following it, and the one preceding it unless itself was the first or last. The figures written on the board in this instance were, of course, 3874683549076328572.

**Subconscious Impressions.**—We have noted that subconscious memory retains perceptions and their attendant effects but does not recognize them. We may also state that many impressions are made of which we are entirely unconscious. Cases are on record of persons who while delirious have repeated quite lengthy discourses, more or less connected of which while in their normal minds they knew nothing. It is Coleridge, I think, who tells of a servant who when ill with a delirium repeated a considerable amount of what later proved to be selections from some Hebrew literature. It later developed that years before this servant had been employed in the home of a rabbi whose habit it was to read aloud as he walked forth and back past the door where the servant was engaged. Unconsciously this material had become registered in the brain of the servant. In the normal state of the mind the servant could not recall any of the material which had been given so correctly in delirium.

**Dormant Memories.**—Not only do the memories of impressions lie dormant in the mind for years but muscular memories may also. The muscles learn lessons and remember them as well as the neurons of the brain. This is the basis of habit. For ten years previous to nineteen years ago I rode a bicycle a great deal but have not ridden for the past seventeen years at all. About two years ago, I had occasion while on vacation to go up town in the village where we were spending a part of our vacation. A bicycle stood by the side of the house and one of the persons suggested that I go on the wheel. The idea interested me. I wondered if I could ride after seventeen years' intermission. So I took the wheel and to my surprise and delight I rode as easily and naturally as I did the last time I rode. The muscles had remembered all those years.

It is told of Houdin, the magician, that while he was "in practise" he could keep four balls in the air at once, and that after an interval of thirty years during which time he had never tossed a ball, he was able on the first trial to keep three balls in the air.

Muscular memories center in the nervous system, and are dependent upon the cortex. Ideas and the emotions caused by them, and the attendant muscular activity become associated in complexes. The idea arising in consciousness tends to arouse the muscular memory. It makes the muscles tingle. They seem *to want to perform* the function which the idea has recalled.

**Limit of Memory Development.**—No one ever reaches the limit of his memory development. One never gets too old to remember. Your memory will improve until your mental powers begin to decline, and then it will still retain impressions, if you will give it half a chance. The difficulty with most persons is that they inhibit the power to remember by telling themselves that they cannot remember. When one

comes to believe that he cannot remember, he will not remember. On the other hand, if he is determined to remember he will find a released energy that will serve him well in the field of recall. De Quincey sums the matter up when he says, "The memory strengthens as you lay burdens upon it and becomes trustworthy just as you trust it." There is no way to improve memory or muscle except thru exercise.

**Material for Imagination.**—Just as sensations furnish material for perception, perception for concepts, concepts for judgment, so memory by retaining, recalling, reproducing, and replacing experiences furnishes material for the imagination. The only material that the imagination can use is what has already entered into one's experience. Some of the experiences may be recorded in the subconsciousness. Such material may affect action, but it does not enter into the work of the imagination. One's entire supply of imaginative material is furnished by the memory, hence, the importance of many and varied memories.

## CHAPTER VI

### IMAGINATION

WE have considered the sense-perceptive processes, or, as they are sometimes called, the perceptual processes, and have learned that the product of that reaction is called a percept. We have also studied a phase of the process of intellection, which process gives us the concept and the judgment. We have noted that these processes do not always follow one after the other, but have seen that in some instances one process runs thru several others. Judging, for instance, is not confined entirely to the comparing of concepts, but manifests itself in comparing percepts, altho it does not reach its highest form until it deals with concepts. So too, we saw, is the case with association. It runs all thru the intellectual processes, grouping percepts and concepts alike.

In the last chapter we studied memory and how it conserves and reproduces the results of former experiences. We noted that memory gives us free range over all the remembered past and can bring it into consciousness beside the experiences of the present and so enlarges our world vastly beyond what the perceptive process alone can do.

We are, in this chapter, to consider another phase of the mind which enlarges our freedom by enabling us to bring all of the anticipated future into the present, here and now. The chain with which, so to speak, we found ourselves bound by the perceptive processes which confines us to the present is lengthened thru memory to enable us to bring all the remem-

bered past, and thru the imagination to bring all of the anticipated future and link them both with the present, and enable us thru a proper interpretation of the past and present to throw some light on the future.

**Memory.**—Memory refers always to definite past experience. That experience is fixed, and unchangeable, and memory must follow the lines of that experience. When we remember a thing we identify it with our past. We have a feeling that *it was* as memory pictures it to be. Yet memory never gives us as definite impressions as sense-percepts do. There is a haziness and an indefiniteness which we did not feel in the presence of the object.

**Imagination.**—Imagination is the name given to the process of image making. It is the ability of the mind to form an idea of things not present. By means of the imagination one is able to respond without external stimuli to an object not actually present. One may have in mind the scenes of yesterday, of last week, of his childhood days. These are revived perceptual experiences and, of course, presuppose memory.

**Images.**—When one looks in a mirror he sees what is called an image. When he looks thru a microscope, a telescope, or a spectroscope he sees an image. These images may be virtual or real, larger, smaller, or the same size as the object depending upon the kind of lens or mirror. In these instances the object and image are both present, but when we speak of an image as a psychological product, we have in mind a different thing. We mean an *ideal representation* of a thing that we have at some other time seen, felt, heard, smelled, or tasted, and that is *not* present now.

**Kinds of Images.**—When we speak of images, we often think only of images of things seen but of course a moment's thought will make it clear that one may have images of other experiences than those of sight. One may have a visual image of

how an automobile looks. He may have an auditory image of how "Misereri" sounds; how limburger cheese smells, how vinegar tastes, and how it feels to have a worm crawl down his neck. These are all images.

**Dalton's Questions.**—In making a study of imagination and of images Dalton asked three general questions about them which may help us to get a little clearer notion of how we may test our own images. His questions are:

1. Illumination. Is the image dim or fairly clear? Is its brightness comparable to the actual scene?
2. Definition. Are all objects well defined at the same time? Or is the place of sharpest definition at any moment more contracted than the real scene?
3. Coloring. Are the colors of all objects quite distinct and natural?

In making these tests a wide variation will be found in regard to the answers of each person. He may have clear images of the colors, but not a very well defined outline of the objects. The outline may be somewhat dim, or he may have well defined outlines of the objects, but not a good image of the coloring, etc.

There will be found a wide variation among the persons whose images are tested. Some will have good images of color but not of form. Others will have good images of the objects from the viewpoint of distinctness, etc.

What is your ability to form images? Try to form images of the following list and try to discover in which you are best. In which are you poorest?

*Color.*—Can you close your eyes and "see" the color of the carpet on the floor of your room? You will need to be careful to be sure that you see the image. You may *know* what the colors are and so confuse your knowledge with your image or

put it in place of the image. Can you see the color of the wall-paper on the walls of your room? Can you see the colors of the pictures that hang on the walls? What colors do you find difficulty in imaging?

*Sound.*—Can you actually hear the music, the air of your favorite song? Can you hear your mother's voice? Can you hear the horn of an automobile? Can you hear the air of a musical selection played on a cornet? On a violin? On a piano? I mean can you form an image of each of these? What one do you have difficulty in imaging?

*Taste.*—Can you imagine how coffee tastes? Sugar? Can you form an image of the taste of aloes? Of a porter house steak? Can you imagine just how peanuts taste? An orange? A grape fruit? Do you find more difficulty in forming images of taste than of the two senses just named? Why do you suppose that is?

*Smell.*—Try to form an image of the odor of roses. Can you form an accurate image of the odor of limburger cheese? What kind of a face do you make up when you form the image? How do you account for it? Can you imagine just how a skunk, or skunk cabbage smells? Can you smell hot soapsuds? Do you think you form images of odors as readily and as clearly as you do of tastes, or flavors?

*Feeling.*—Can you form an image of the feeling when lightly rubbing your fingers over a well polished table? Do you form an image of how it feels to rub your fingers on a piece of silk? Can you image the feeling you would have in drawing your thumb along the edge of a razor? Many persons on trying to image this last feeling, find that it makes a shiver run down their backs. Why should it?

*Motion.*—Can you actually see in your mind's eye a train in motion, or do you see it standing still even tho you know it is moving? Can you form an image of the flag waving in the

breeze, or does it look like a painted flag showing the folds but having no motion? Can you form an image of an airplane moving thru the air? Do you find it easier to image the airplane than to image the train? Many persons do. Why?

*Form.*—Can you see the actual form of the table in your dining room? Do not confuse your knowledge of it with your image but try to actually see it. Can you see the design of the carpet on the floor and not see the color at all? It is interesting to know how many persons can see the design who cannot see the colors at all and vice versa. Can you form an image of your friend's face, an image that gives all the detail? Can you describe that image so that one who does not know your friend can pick him out of a dozen or twenty of about his age and general appearance? I talked with a man recently who told me that he could not see his most intimate friend's face clearly enough to see whether he wore a mustache or not. He said he knew his friend did not wear a mustache, but he could not form an image clearly enough to see his face.

*Number.*—Can you form an image of a room with a dozen persons in it and close your eyes and see where each one sits and identify the person in each place? Can you form an image of a baseball field and imagine the players in their places on the field and the opponents on their bench? Can you see the plays as they are made?

*Heat.*—Can you form an image of the temperature of warm water? Can you imagine how it feels to be burned with hot water? How does it differ from an image of being burned with acid?

*Cold.*—Can you imagine how it feels to step your bare feet on a cold, tile floor? Does it make you shiver? Did you ever touch your tongue to a frosty metal doorknob? Can you form an image of the feeling you experienced?

Can you imagine your feeling as you try to find your way thru the house in the dark?

I have called your attention to so many of these because the imagination uses the same material that the memory does. It must turn back to the perceptual for its building supplies. If you find that you are able to form accurate images in one or several of the above group of sensations, you have a clue to your ability and to the field of activity into which you can put your efforts with hope of success. If you find that you are unable to form the proper images in one or more of the groups, you have a clue as to what you ought to keep out of. If you find that you cannot visualize colors well, you would hardly expect to succeed in a line of activity where colors play a large part, because you would be obliged to make all kinds of combinations of colors. If you could not image the combinations clearly, you would be badly handicapped, and placed at a disadvantage with the one who could. You would find it necessary to exert vastly more energy than he to succeed as well as he. You will do better in some line where you are not handicapped.

**Observational Material.**—Since imagination is confined to the material provided by sensation and perception, we see again how important it is that the mind be well stored with observational material. We ought always to be on the lookout for obtaining an increasing supply.

**Imagination and Remembering.**—Remembering must always follow the lines of experience and if it is accurate it retains all the details like the photographic negative. While imagination is not an accurate image of the experience. It is more like a retouched negative, or more likely like the oil portrait in which the features are idealized and certain characteristics made to stand out more prominently than the others. No portrait looks just like the person it is intended to portray. This reminds me of the wife who went with her husband to

have his picture taken. When she received the proofs she was very much wrought up. She went to the photographer and told him she would not take the pictures. She said, "Look at that, he looks just like a baboon." The photographer replied, "You should have thot of that before you had his picture taken."

Imagination enables us to anticipate the future, but in so doing we are obliged to use the materials from the past. It is as impossible to create in the mental as in the material world. We cannot change the past experience but we can, thru imagination, reorganize it, make a new suit out of the material of the old one, so to speak, and we can determine, to a degree, what the new one shall look like. Thru imagination we are, to a degree, masters of the future.

Remembering is reproducing an experience we have had. Ideal representation, or imagination, combines the remembered material of two or more experiences, leaving out some elements and adding others and so produces a new idea.

**Images and Percepts.**—Images are usually less vivid than percepts. They contain less detail. They give us the outline of the percept, or a skeleton of the plan of the percept, so to speak. The percept may be very faint sometimes too. Often it is difficult to determine whether we actually heard a very faint sound or whether we just imagined it. Then again we may imagine voices that are so loud and distinct that we have difficulty in convincing ourselves that we did not hear an audible voice speaking. We remember the story of the boy Samuel in the Bible. He heard a voice calling him but no one else heard it altho they were evidently within hearing distance. The interpretation of the voice made by Eli is of interest for we know that in the day of the occurrence people had not the slightest knowledge of the formation of an idea, nor of the power of the imagination nor its method of operating. Voices,

they thot, never came from within but always from without. They did not understand how "one can hear himself think," much less how he can know the results of subconscious mental reactions. Coming from outside, and no one present having spoken nor heard a voice, Eli very readily attributed the voice to Jahveh, his God.

We are able to control the imagination as we cannot control percepts. If we look at a red object we see the red. We may interpret it as blue, or "see" it as blue thru exercising the imagination, but the impression made upon the retina of the eye is made by the red waves, and the percept is red. Of course we can turn our face in another direction and get away from the red, but as soon as we do we are compelled to form other percepts because of what we see in the new position. But we cannot have a percept of red when we are not looking at a red object.

We can recall the image of the red object no matter where we are. We recall pictures, scenes, persons when we are far from them. As I sit at my desk writing this, I can recall the first view I ever had of the Jungfrau as I looked out of my hotel window one morning in Interlaken, Switzerland. A heavy snow storm had just passed and left the atmosphere as clear as crystal, and there in all of its majesty and beauty stood the Jungfrau apparently within walking distance yet in reality miles away.

I can see myself crossing the Grindelwald glacier with a party of friends in a pouring rain and stopping in the cottage of a mountaineer later for shelter. But in neither case do I have a percept of the Grindelwald or Jungfrau. To have that I must be where the light waves from them can strike my eye.

I can imagine things differently than they are. I can imagine a six foot man three feet tall, a lean man as a fat man.

I can imagine a yellow orange red. I can assign all sorts of qualities to an object by use of the imagination.

Percepts and images differ also in respect to their environment. The percept always has a definite environment. You see it as it is at the moment you look. Its relation to its environment is fixed, but not so with the image. We may give the image any environment we wish. We may see the Statue of Liberty standing on the pinnacle of St. Paul's Cathedral in London as well as to see it on Bedloe's Island in New York harbor. We may imagine an honest man a rogue, or the reverse. We may construct an environment the like of which was never seen, but we cannot form a percept of it.

Sometimes the image is so distinct that it dominates consciousness as in hysteria and delirium. We shall look into this phase of the question later. As we have already seen, we are compelled to accept our sense-percepts as normal and, therefore, as furnishing us trustworthy data. We have grown up with this idea in mind and having become habituated to accepting our percepts at their face value, we readily accept as true anything that we regard as perceptual.

**Imagination and Beliefs.**—Imagination is at the foundation of most of our ideas and beliefs. We find ourselves believing certain things and then try to find reasons for the belief. That is, we seek to rationalize them. We seldom do much thinking before a belief has been set up, hence, as a rule, our beliefs are not the result of reason, altho we have attempted to find a reason for them after they have become ours. We rationalize our beliefs, but we seldom analyze them to discover how we came by them. One believes in God, but what does his idea of God mean? Why does he hold it? He has certain ideas about the Bible. Where did he get them? Why does he hold them? In almost every instance upon inquiry, you find one seeking for a reason for the belief and when he thinks he

has found one or two that satisfy him, he goes no farther. He does not want to find facts of experience that tend to fall out with his belief. He likes to believe what is pleasant rather than what is true, especially if it does not accord with his inherited beliefs.

Of course, few like to stand alone. Even misery likes company. We like those who form their opinions as we do and who *believe* as we do. It is that which has made religious institutions exclusive. They rather exclude than tolerate different opinions. It is easier, and they do not have to adjust themselves to the beliefs of those whom they have excluded.

When we seek for companionship in our beliefs, we seek for authority and too often our feelings and beliefs remain settled because we settled them years ago and do not wish them disturbed. When we can find no better support for our position, we fall back upon the stock proof of "they say." Emphasizing that Shakespeare was right when he said, "All's true that is mistrusted."—Winter's Tale. But only so far as facts are imaged do they influence beliefs. If we do not image all the facts, we are bound to be warped in judging, and can have little or no sound basis for belief. We believe what we imagine.

One's *fundamental* beliefs control his actions, but often his actions do not give evidence of having been caused and controlled by his *professed* beliefs. That usually results from not having recognized the relation of beliefs to knowledge. Beliefs are always the fringe of knowledge. One has an experience and as a result he *knows* something. He seeks for an explanation of his knowledge, and sets up an hypothesis to account for it. In other words, he believes it was caused thus and so. He imagines it came about in a certain way. His actual beliefs always sustain this close relationship to what he knows. Often one imagines he believes certain things, but

they have no relation to what he knows. They are not beliefs. They do not direct his actions, they are imaginings only. How often have we heard men say, "You must believe," as tho believing were a matter of the will. You might as well ask a six footer to be seven feet as to ask one to believe by sheer force of the will. One may say he believes, and for the time think he does; but if his belief is a fundamental thing he will not hold it by virtue of will power, but because he can give reason for it which satisfies the highest power of the mind.

**Imagination and Bias.**—Bias is a characteristic of the mind by which it finds itself leaning toward or away from certain ideas. A real bias or prejudice may be quite unconscious to the mind that holds it. If one knows he is for or against a plan or proposition and does not know why, he is said to be biased, but often one is entirely unconscious of the least feeling of bias.

Lawyers in court are always on the lookout for the biased juror. If one knows that he is prejudiced against certain things he may be able to take his prejudice into account and render a decision according to facts, but not so the unconsciously biased man. Leading questions in court tend to create a bias in the mind of the witness. Suggestion even in a mild way tends to set up a reaction that is either favorable or unfavorable to the thing referred to. Your friends tell you that you are working too hard, and you feel the result. Your work does seem harder. You had not realized that you were working so hard. Clairvoyants take advantage of this quality of the mind to establish a subconscious bias which gains for them the confidence of their clients who tell the clairvoyant a lot of things that are retold to the client without his recognizing them at all.

The reason for all of this is that the imagination has clothed, almost unconsciously to one, these suggestions and hints with a

sanctity that approaches the "holy of holies." One will take offense at almost nothing so soon as he will to be told that he is prejudiced, or biased. The imagination has played him the trick it plays us all unless we are on guard all the time.

It is necessary for us from time to time to drag out into broad daylight of reason these ideas of ours and examine them, analyze them, learn their pedigrees, and see whether they are of pure heritage or a mixture of all sorts of suggestions that have come to us unaware and upon which the imagination has done its work.

There is a common prejudice in favor of those who accuse. While we say one is believed to be innocent until proven guilty we are too prone to act on the principle that the Irish juror said he did. After having served on jury a friend said to him, "Pat! how do you reach a decision? What do you pay most attention to, the testimony, what the attorneys say, or to what the judge says?" Pat replied, "I don't pay any attention to the lawyers nor to the judge and I don't care what the testimony is. I just looks at the prisoner and says to meself, 'if he ain't guilty what's he here for,' and brings 'em all in guilty."

During the war all that was necessary to arouse enmity against one was to have someone, it mattered not who, call him a Red, a bolshevik, socialist, profiteer, slacker, and immediately we were all quite willing to have almost any kind of treatment visited upon the accused. Our imagination became so active and our fears so aroused that almost any rascal could accuse the most respectable and get a hearing.

In spite of our knowledge of the process employed in propaganda, we are inclined to believe what is told just because it is told. We seem inclined to believe that if a thing is told often enough it thereby becomes true, and the propagandists know that, and so they keep on. There is a tendency to believe the worst one can hear about anyone instead of a determination to

believe only the best, and in neither case does one bother his head about getting at the truth. He just believes it and repeats it "for what it is worth."

**Imagination and Idea.**—The formation of an idea involves attention and memory. It results in a reorganization of the past and present for future use. Relating the percept, the associated notions, and the image results in producing the idea which is in part at least a new creation. It is the product of the imagination. It is an instance where the whole is greater than the sum of all the parts. We are creators just in so far as we are able to use the imagination in this process, and when we realize it, we find an inspiration in the fact that lifts us above the ordinary instinctive following of impulses.

However, we must distinguish between the idea and the image. An idea is what we use instead of the object and in its absence. It is not like the object in all its detail. As we have already seen, parts are omitted, others added, rearranged, modified until the new creation stands out in the mind in place of the object. The image is much more like the object than the idea is and yet they are often confused. The idea is the *meaning* of the image and not the image itself. Here, again, the varying powers of men are seen. Two persons look at the same object and have somewhat similar images of it but of the meaning, what a difference! One *sees* the block of marble and that only. The other *sees* within the block and enclosed by it a Venus de Milo awaiting release. One sees a political office as a job with a salary attached. The other sees an opportunity to serve humanity. One sees in an educational institution a four years' humdrum of routine to be lived thru. The other sees in it innumerable opportunities opening out in the field of learning and of life.

When memory images become stronger than sense-perceptive material, one is old. He is living in the past. He has no

new ideas, no vision. It is possible for one to keep himself young by keeping his sense-perceptive processes always active. He need not get old mentally. Shall we get old?

What then? Shall we sit idly down and say  
The night hath come; it is no longer day?  
The night hath not yet come; we are not quite  
Cut off from labor by the falling light;  
Something remains for us to do or dare;  
Even the oldest tree some fruit may bear;  
Not *Cædipus Coloneus*, or Greek ode,  
Or tales of pilgrims that one morning rode  
Out of the gateway of the Tabard Inn,  
But other something, would we but begin;  
For age is opportunity no less  
Than youth itself, though in another dress,  
And as the evening twilight fades away  
The sky is filled with stars, invisible by day.

Let me make clear just what I mean by the difference between the idea and the image. Think of a great painting like "The Horse Fair." The artist in studying and painting the picture had to give unbounded attention to the details of picture making, the colors, the canvas, the perspective, lights and shades, position of the horses, the men in the picture. In fact she was much concerned with the images of the objects which she was painting. Of course she was concerned with more than that, but with that much she had to be concerned, if she was to paint a picture that would satisfy her.

We visit the Metropolitan Art Gallery and look upon that masterpiece and with what are we concerned? None of the things named above. We are concerned with the *meaning* of the picture, the *meaning* of the *images* of the horses and men and not with the images themselves.

The pictures of war to the artist mean one thing as he works them out. He is concerned with the images of the things of war in order that he may make us see the meaning of war. The poet uses images only that he may teach meanings. Read the following from Richard Le Gallienne and

note the images that arise in your mind and then note the meaning of those images as the effect makes itself felt upon you. You see a meaning of dress parade and the butchering of the battle field that makes you hate the thing. The real meaning of drum and fife and dress parade is the "broken old mothers, and the whole dark butchering without a soul."

War  
 I abhor;  
 And yet how sweet  
 The sound along the marching street  
 Of drum and fife, and I forget  
 Broken old mothers, and the whole  
 Dark butchering without a soul.

Without a soul—save this bright treat  
 Of heady music, sweet as hell;  
 And even my peace abiding feet  
 Go marching with the marching street,  
 For yonder goes the fife,  
 And what care I for human Life;  
 The tears filled my astonished eyes,  
 And my full heart is like to break,  
 And yet it is embannered lies,  
 A dream those drummers make.

Oh it is wickedness to clothe  
 Yon hideous, grinning thing that stalks  
 Hidden in music like a queen  
 That in a garden of glory walks,  
 Till good men love the things they loathe;  
 Art, thou hast many infamies,  
 But not an infamy like this.  
 O, snap the fife and still the drum,  
 And show the monster as she is.

The effect of the theater is in the meaning, not in the images. It is the matter of interpretation. We ought to give attention to the use of the imagination so that we may interpret correctly. Not stop with the image but "follow thru" to the meaning.

Examine the following quotations and see what part imagination plays in each:

"These obesity doctors live on the fat of the land."—*Asheville Times*.

"If placed end to end the national debts would reach where? To the conclusion that war is unprofitable."—*Colorado Springs Gazette*.

"A tiny maid, held up to hear her father's voice on the telephone, burst into tears. "What are you crying for?" asked her mother. "Oh, mamma," cried the child, "however can we get daddy out of that little hole?"—*Morning Post*.

"The *Literary Digest* speaks of a 'Plan for giving every man work to fit his brains.' But just think how many people that would throw out of work permanently."—*Nashville Southern Lumberman*.

"The nations should make peace first and then they should make it last."—*Norfolk Virginian Pilot*.

**Imagination and Environment.**—The importance of the imagination is that it provides us material for interpretation. That material comes from our environment of houses and lands, cities and villages, companions and family, etc. What *meaning* can the workers of a factory get from the long rows of houses all built the same and looking alike? There is nothing in them to arouse the imagination. Business men have begun to learn that, and in many instances now we find some attention given to architectural design of houses for the workers. Just as a new toy arouses the imagination and kindles new ideas in the mind of a child, so to a greater degree does a change in environment arouse the latent powers of a man. This is the great value of travel, reading, lectures, concerts. This is the great value of group meetings of all kinds. New images are aroused by them and new meaning arrived at. Can you remember in your younger days the thrill that went thru you when on some little journey you reached the top of some hill for the first time and saw the landscape spread out before you? How

far you could see! You could almost feel yourself grow. You were trying to keep pace with the growth of your world. You were never the same again. A new meaning of things had come to you.

One's success in life depends upon the meaning he reads into the images that are aroused in his mind. If one is engaged in manufacturing and his men are like machines to him, if he reads into them the same meaning he reads into his plant, he is going to get from them just what he gets from his machine, a small percentage of return for the power furnished to the machine. He will furnish a certain amount of power to the men thru the pay envelope and he will get a certain percent of that power delivered in the task, and that is all. But men are more than machines. Men are able to understand the meaning of things. Often they do not get the correct meaning, then they need help. If employers realized that what one can *do* depends upon what he *knows* and that what he knows depends upon what he *sees* with his mind's eye, his imagination, they would make greater efforts to help men see. The man who cannot see beyond his job, cannot see the job. The student who does not see beyond the recitation does not see all there is in the recitation. The one who reads only what is printed in the book does not *read* the book. It is the meaning beyond the task, beyond the recitation, beyond the page of the book that is important. We are very much alike in looking at the surface of things. We get much the same percepts but there the similarity ends. One sees that and nothing more while his neighbor goes out into the immensities of the universe, or into the very depths of the human soul and the rest of us are strewn all along the road between them, not because we are compelled to be, but just because we have not learned to *see* the meaning of things. New possibilities are lost upon the man who does not see, but are quickly discovered and acted upon by the imaginative man.

New necessities and new expectations confront us. Who shall provide a way to meet them? The one who sees the meaning of things. Does that mean you? You ought to see farther into your task than any one else. If not, you ought to discover what the other man sees that you do not. It is the ability to see that made of a newsboy a Thomas A. Edison. It is the ability to see that produced a Marconi, a Langley, a Wright.

**Control of Imagination.**—Imagination operates under principles the same as other forms of behavior, such as the memory, conception, etc., and it may run wild or be controlled. Sometimes the imagination, if uncontrolled, may outrun the power of perception and of memory to such an extent that one cannot remember things as they were or are. He lives in an imaginary world and becomes quite abnormal in certain things, a monomaniac perhaps. He has a case of the “nerves.” He has unwittingly let his imaginative ideas run riot until he has become a slave to them. Another person may control his imagination and make it serve him. We shall see more about this later in the course. In normal life freedom of imagination ought not to interfere with the reality of the sense-perceptive material, but rather enrich it.

**Constructive Imagination.**—We have noted that the imagination is confined to the material provided thru the sense-perceptive processes and that the reappearance in consciousness of these impressions is called images. When these images are rearranged, sorted, enlarged, reduced in size, etc., for a particular purpose, it is said to be the work of the constructive, or creative imagination. We shall refer to this function of the mind as the *constructive* imagination. We build rather than create, altho to a degree, one does create in the ideational process.

When one reads, or listens to a description, he constructs the scenes as they are described. When a landscape is referred

to with its hills and valleys, trees and brooks at once one's mind builds up a scene to correspond. Usually one's mind runs back to some scenes of an earlier experience which he idealizes by adding or omitting elements to make it fit the description. That is constructive imagination. Finding out things for ourselves in any line is the work of the constructive imagination. Ingenuity whenever applied involves imagination. Constructive imagination enables the inventor to set up an hypothesis and then test it. It enables a Shakespeare to people a stage with characters and make them speak. It was the great asset of Beethoven, Raphael, Sir Christopher Wren, Captain Eades, Titian. Whenever one follows his own bent, whenever he seeks to build a new world out of the material of the old, he is calling upon the power of the constructive imagination.

It is the dreamer, the one with imagination, who has made the world move. Without imagination the world would still be in the stone age. It is the dreamer who invents and discovers.

Galileo looked at the moon and dreamed of means to approach it. He invented the telescope to see more clearly the mountains of the moon. He discovered the moons of Jupiter, and the pendulum. Watt dreamed of controlling the power of steam, Whitney of the cotton-gin. Men with imagination gave us our dyes and medicines, and are revolutionizing the world thru chemistry applied to industry. Men with imagination are the most practical of men.

Imagination controlled by reason becomes the greatest power of the human mind. That power becomes active at puberty and remains active as long as used. It is the inner vision of what is now invisible. One sees things as they are with his physical eye, and as they ought to be with his mental eye. Imagination closes the eye of the body and opens the eye of the mind. The constructive imagination combined the twenty-six little

railroads between New York and Buffalo into the New York Central lines. It has built steamships, bridges, cathedrals, and airplanes. It combines concepts and hitches them to useful work. It seeks order in the universe.

**Types of Constructive Imagination.**—There are several ways in which the imagination deals with the material conserved by memory.

1. It may separate some of the items from the group, or separate the group from its environment. It may then deal with the elements separated, or with the ones remaining.
2. It may combine some elements from several groups, or add some elements to the group. It may imagine paint added to a house, a spotlight on an automobile.
3. It may substitute in a landscape a mountain for a valley, a creek for a path. It may put a man's head on a horse's body.

**Your Imagination.**—It is said that one is worth \$2.00 a day up to his ears. Above that depends upon what he sees. Does one have vision? "Without vision the people perish," said a preacher of old, and without vision the individual is of little worth above the power of muscle. Have you ever thought of being something else than what you are now? Can you visualize clearly your present situation? Can you see clearly the possible ways of improvement? Do you see and can you command the means necessary to accomplish that improvement? Do you see the difficulties to be overcome? Have you a definite plan of action? Do you have a vision of your success? Does your blood tingle as you see yourself winning? If you can answer all of these questions in the affirmative, you are on the way to success. Without vision, imagination, success is impossible.

It may be that you have been deluded by the vision of incompetence. You know others can succeed but think you cannot. You have never actually seen yourself in the desired position because of the delusion, but you must "Put yourself in his place." You must see yourself in the position which you would like to occupy. You must make circumstances serve you instead of being buffeted by circumstances.

Have you ever thought what you would do if you were deprived of your best friend? If you were worth a million dollars? If you were president of Harvard? Governor of your state? President of the Standard Oil Company? If you were to become the head of the organization or institution with which you are connected? Have you ever thought what the world would be like if every person was actually prompted by the same motives you are? Have you thought seriously of what America is to become in the world? Have you thought of your relation to the great moral, ethical, and religious problems of the day?

**Problems.**—It is only the intelligent person that has any problems. The dull mind sees no difficulties. Everything is very simple. The old saying of "Know nothing, fear nothing" is quite true. "Fools rush in where angels fear to tread," but they are the only ones who do. The undisciplined mind does not want to suspend judgment. It wants an answer now. It wants to be sure. The angry man cannot wait for the law to take its course, so he fights now. He cannot "see." There is tendency to minimum effort, a desire to get things the easiest way. We fall into the habit of taking that way whether we get the things we want or not. But one must get the facts. He must inquire, investigate as the only sure way to the right road.

**Power of the Imagination.**—The power of the imagination upon the interpretation of experiences is most remarkable.

This is seen in the testimony of many witnesses in court. It is not at all unusual that a witness telling what he has seen is very much more specific a year or two after the occurrence than he was shortly after it, and yet almost always the more detail a witness recites the more inclined the jury is to believe him. The witness usually gives as a reason for the great detail in his later testimony the fact that he has had time to think it over and to *recall* all the circumstances. The witness has certainly not seen the occurrence repeated. He has not seen it again. He has let his imagination work. He has read or discussed, or both, the details until often unconsciously he has come to believe that he saw what a week or two after the happening, he declared he did not see.

This may be seen from the case of Sacco and Vanzetti who were convicted of first degree murder in Dedham, Mass., in 1921.

Shortly after the crime a witness who saw the holdup men from the second story of a building about 80 feet away said, "I do not think my opportunity afforded me the right to say he is the man." After a visit to the Police Headquarters where she studied Sacco minutely, the witness admitted that she could not identify him as one of the two holdup men. More than a year after she gave a minute description of the holdup man—color of hair, build, etc., and positively identified Sacco as the man. From the standpoint of psychology this is interesting. She had opportunity during the visit to Police Headquarters to observe the color of hair, build, etc., which she could hardly have been able to do from the second story window eighty feet away. Why did not the witness mention these characteristics on the first examination? Why could she not identify him then? If she knew more about the matter a year later, she did not learn it from seeing again the holdup men in the street on the day of the murder. How did she learn it?

Another witness at the preliminary hearing said she could not identify the man. A year later she was positive in her identification. Thirteen witnesses, some of them within a few feet of the car in which the murderers rode could not identify the two men. Yet she from a distance of eighty feet could.

There is always a tendency for the mind to idealize or to degrade a situation. We idealize those we like and detract from those whom we do not like. History, heroes, and villains are "dressed up" by the imagination as the little child "dresses up" the rag doll, or a block of wood. We construct gruesome pictures of calamities, we build valhallas, happy hunting grounds, heaven, hell, the world of poetry and romance. We "see" all of these as we wish them to be.

Things seem so simple after someone has mastered them and pointed the way to our understanding, as for example, "The Dynamo."

The mightiest things seem simple  
And easy to understand;  
When Genius has mastered their secrets,  
And put the key in our hand.

Everyone knew the magnet,  
And everyone knew the coil;  
But Genius wove them together,  
And eased mankind of its toil.

Man was afraid of the lightning—  
Awed at the cataract's roar;  
But Genius bound them in harness,  
To work for man evermore.

But Man scarcely deems it a wonder,  
So simple the dynamo looks;  
Genius he thinks a mechanic,  
Romance he looks for in books.

—WALDO T. DAVIS.

**Limits of the Imagination.**—Thru the power of the imagination one has free range thru space and time. He can swing back over the entire history of civilization. He can turn the

telescope into the far reaches of the universe and then continue the journey with Belot, astride a ray of light, travelling at speed of 186,000 miles a second. The distances soon become too great to measure by such units and he begins to measure with light centuries. After 600 centuries of travel they come to the edge of the Milky Way and continuing for between five and six thousand centuries, arrive at the great spiral nebula of Andromeda and still the imagination goes on.

We can turn the spectroscope out into those far distant parts of the universe and study the material of which worlds are being made and see the process in operation. We look thru the strongest microscope and see worlds of life almost too small for our ordinary mathematics to deal with, and still the imagination goes beyond the reach of the most powerful instrument.

It would seem that the imagination is limitless and all powerful. Yet it cannot imagine eternity, goodness, truth, beauty, nor the absolute. It cannot bind particulars into unity of law or principle. It may select one particular and idealize it, a good man and idealize him, a beautiful cathedral and idealize that, but it cannot generalize. As William DeWitt Hyde once said, "Imagination gives us

ideas but not laws,  
types but not principles,  
art but not science,  
mythology but not philosophy."

In order to attain these we must employ another activity of the mind.

## CHAPTER VII

### THE REASON OR HOW WE THINK

WE have seen in an earlier chapter that we have no way of knowing the mind except thru bodily activity. There is no such distinction between the mind and the body as has been thot to exist. We have seen that we are not aware of many things which we perceive, remember, and infer. They are stored away in the unconsciousness. Yet while they are stored there apparently out of mental reach they have a good deal of influence on our conscious reflection. We know that one cannot understand the mind without understanding the body and vice versa. Every thot pulsates thru the body and every disturbance of the sympathetic nervous system disturbs the mind. What we remember is only a very small part of what we have experienced. Those things which we seem to have forgotten completely and those acts that have become habitual make up a large part of our unconsciousness.

**Day Dreaming.**—We have seen that day dreaming, or reverie, is free association of ideas, and that memory and imagination are both active in the process. Day dreaming is closely related to the subconscious. Many of the aircastles of our imagination are modified by forgotten experiences and by others which are pushed up into consciousness from the subconscious reservoir into which in past days they have been poured. Day dreaming and reverie are to most of us very pleasant occupations but they do not add any knowledge to our store. The process is more or less aimless.

**Choosing.**—I may have finished my day dreaming. It is time to move. The sun has gone down. It is getting chilly. I am brought to myself by some slight discomfort. It may be that there has come into my mind the thot that I had promised to call at my friend's house before dinner. Anyway, I feel I must be going. How shall I go? Shall I take a car or walk? I remember that the cars are a half hour apart and that one just went by a few minutes ago. So I decide to start on afoot. Shall I go by the lower road or by the upper one? I decide to go by the upper one. I have chosen between two alternatives and then between two others, but I have not necessarily added anything to my stock of knowledge as a result of my thinking.

**Rationalization.**—We saw in the last chapter that we often find ourselves holding certain beliefs. We try to find reasons for them. We try to make them seem reasonable to us and hope by so doing they will seem reasonable to our friends also. We do not try to learn the pedigree of the belief, or to discover the history of an idea. We rather seek arguments to support some preconceived idea. We find the *excuses* for our ideas but not the *reasons* for their existence. The wish is father to the thot. We cannot stand complacently by and have our pet ideas disturbed. We must *think* out some arguments to support them. But we do not think. We reject everything that does not "square" with our view of the situation. We do not by this means add anything to our stock of knowledge. Rationalizing our beliefs never enlarges or broadens them. Knowledge is a means to power. Rationalization, as we are thinking of it here, is the opposite. It really decreases one's power.

There is no occasion for one to begin the process of rationalizing until some move has been made toward a more advanced position in that line of experience. There was no

need to "rationalize" Ptolemaic astronomy until after the announcement of the Copernican theory. There was no need to "rationalize" the catastrophic method of creation until after the days of Sir Charles Lyell and Darwin. Hence, all attempts at "rationalization" are to enable us to find excuses for doing and believing as we do. It requires less effort than it does to follow the experiences of those who have gone on ahead of us. The subconscious motto of the "rationalizing" man is, "Where ignorance is bliss it is folly to be wise." Such persons do not add to the world's knowledge, because they do not think. They choose between two groups of facts. Shall they take the upper road or the lower? They choose to take the lower. They have never blazed a *new* trail in their lives.

**Constructive Thinking.**—All normal individuals are endowed with a certain amount of curiosity. One leaves his office in a hurry to meet an engagement. As he goes out of the building, he sees a group of people in the street. His curiosity leads him to go over and *see* what is the cause of the gathering. Automobile accident! He goes on down the street. Men are excavating for a new building. He has no vital concern in the matter but he just *looks in* to see how the work is getting along. And so on, having his curiosity aroused at every turn and in between turns. It is the instinct of wonder, or of curiosity, in every one of us that opens the way to all human achievement. One wonders and then seeks to find the cause behind the phenomenon. Where thousands look on in idle curiosity, one looks on with an inquiring mind and really observes, reflects, and then something happens. Thousands of people had seen apples fall before Newton's time, but no one reflected on the phenomenon enough to discover any relation between the motion of the moon and the falling of the apple. As a result of Newton's observations and reflections the uniformity of gravitation thruout the solar system was estab-

lished. Later the observations and reflections of the two Herschels in regard to double stars established the fact that gravitation is uniform thruout the universe.

While Michael Faraday in 1831 was observing and reflecting upon what would happen if he rotated a piece of copper between the two poles of a horse-shoe magnet, others were observing and reflecting upon the political and social conditions of England. The result of his efforts was the invention of the dynamo; of theirs, the Reform Bill of 1832. In both cases real thinking was done. They not only chose between two ways, but blazed a *new* way. They enlarged the knowledge of the world. They did constructive thinking.

**Thinking of Animals and Man.**—Animals think after the simpler form referred to above. Dogs and cats have ideas and they can express them in some form of language. The dog speaks with a bark, a growl, a whine. He talks with his ears, tail, hair. The cat speaks with a purr, by rubbing against one, by spitting. Each of them uses a form of language but it expresses the most general ideas only.

Thot is an elaboration of memory. No thot is possible unless its material is derived from memory ideas and, as we have seen, no memory idea is possible which has not at some previous time entered consciousness and been again aroused by a sensation. Memory, imagination, and thot are all limited to the materials of sensation. The qualities of memory, imagination, and thot depend upon how one recombines or reorganizes, in whole or in part, the neuron patterns formed by earlier stimuli.

Because the man can do more with the material of sensation than the dog can, he has a better memory, better imagination, and better powers of reflection. I look at my dog and he looks at me and he seems to "see" just as much as I do, but a cat crosses his trail and he runs after her. He cannot help

it. It is instinctive with him. The neuron patterns in his brain have been so set that when a cat crosses his field of vision, he runs. He obeys an impulse because he has not learned to control it. He makes no choice under such circumstances.

**Instinctive Action.**—Instinctive action differs from reflex action for it involves more complex and extensive neuron patterns, and may be accompanied by consciousness. The dog is conscious of running after the cat, altho he probably does not know why he runs. We speak of an action becoming instinctive, when in reality we usually mean impulsive. That is what the action of the dog is in running after the cat. The really instinctive actions are the result of neuron patterns in the brain that were there when one was born. The impulsive action results from the stimulation of neuron patterns that have been acquired by the individual, and not inherited.

One acts instinctively without any idea of the result. Impulsive action follows a simple idea. One is made angry by an action of another. He is possessed of one idea. He strikes. A boy has a stone in his hand as he walks along the road. He comes to a vacant house. He feels an impulse to throw the stone at a window. No sooner does the idea enter his mind than he throws the stone. When taken to task for breaking windows, he says, "I didn't think." He told the truth. He did not think. He acted upon impulse, a single idea. Boys are often called criminals and savages because of some of their instinctive and impulsive actions. They may be little savages, but they are not criminals. They may be unmoral but not immoral. The boy acts upon impulse just as the dog does. The boy can be taught better as his experience broadens. He can be taught to choose between two lines of action, and so bring himself under conscious control.

**Experience.**—The boy and the dog may both live thru the same series of events, but they will not, as a result of that, have the same experience. Simply living thru an event does not give valid experience. In order that one shall have a valid experience, he must know the causes and effects involved. Changes must be related to the results. We learn something thru a valid experience. Reflexes, the subconscious, and the habitual give very little real experience. The value of an experience is determined by the amount of conscious effort aroused in opposition to the subconscious, and the habitual. Individual experiences do not establish principles. Individual experiences furnish subjective certainty, but principles cannot be established until objective certainty is established. The ability to discover principles and find ways of establishing objective certainty is what distinguishes the great from the small man.

Our great need is to form new ideas and to get experience out of ideas we have learned about from others. Some ideas are incarnate, some are in books where we have an opportunity to get ready made the experience of great minds and make it our own, but to be able to gain a real experience from the suggestions of others, is a difficult task. We read of an idea, but to so think into it that we shall be able to see ourselves going thru the actual experience the writer went thru in arriving at his idea so that in a sense we can make it our own requires effort. If our concepts are not accurately formed, there is a danger that even tho we read his words we may not think his thots. His words may recall experiences of ours quite different than his just because we have not a group of accurately named concepts.

**Information.**—We may secure information by following the thots of others but information is not knowledge. The securing of information is not the chief end of education. The

end of education is the securing of knowledge and discovering a way in the securing of it that shall help one discover more knowledge.

Knowledge is the result of what one has felt, thot, and done, or more exactly, knowledge is *the result of the interpretation* of what one has felt, thot, and done. Learning is an acquaintance with what others have felt, thot and done. It is possible for two persons to go thru the same experiences so far as outward appearances are concerned, but the interpretation of those events will vary considerably. One will interpret so that he makes a real gain in knowledge while the other makes none. Wisdom is knowledge and learning combined.

**Intelligence.**—Intelligence is determined by what one can do with what he knows, and what he knows is a result of his reflection. Thinking is an intellectual process. The thinking of Benedict Arnold was just as good as far as the accuracy of the process was concerned as was that of George Washington. Thinking depends upon the accuracy of the process and not upon the goal or the motive. Thinking is in no sense moral. The biggest rascal may think just as accurately as the greatest saint, and the morally sound man may be the most illogical. Thinking is not a spontaneous process like the digesting of food or breathing. It is seeing relations that lead to certain consequences.

**Seeking Relations.**—One who thinks is always on the lookout for the discovery of new relations. It was in looking for relations that electric waves and the Hertz waves were identified. We need to study general conditions so that we will not waste time. Some years ago certain railroad men who were logically minded decided that the laws of triangulation should be applied in deciding where new railroads should be built. They remembered that the two sides of a right triangle are longer than the hypotenuse. So they decided they

would build a railroad thru New York state from New York city to Syracuse, following the hypotenuse of right triangle which had its right angle at Albany and one acute angle at New York city and the other at Syracuse. This would make their road considerably shorter, while the trains of the New York Central would still be obliged to travel the longer route. As a result the New York, Ontario, and Western Railroad was built, but in spite of the shorter route of the newer road the thru traffic still goes over the New York Central because of the better grade. This is because distance on railroads is measured in hours and not in miles. The general conditions were not taken fully into account. The results were loss of money, time, and effort, and the Ontario and Western has always remained a second or third class railroad.

**Poor Thinking.**—Poor thinking may be the result of several things. One may fail to get all the *facts* that bear on the case. He may fail to properly *classify* the facts, because of his inability to distinguish essential from non-essential elements. He may not *properly relate* cause and effect. He may not deduce the right result or reach the right conclusion. Any one, or all of these, results in poor thinking. Good thinking must, therefore, be the opposite of all of these.

**Difficulties.**—It is difficult to reason well because often we do not know enough about the matter to begin with. One must know a good deal about a question before he knows enough to reach an intelligent conclusion about it. For example, the masses cannot think about political questions for this very reason. They do not know enough about them to enable them to do any real thinking. They accept views of leaders who win them, as we have seen in a previous chapter, by catch words and slogans.

Many an argument *sounds reasonable* because we do not know enough about the subject to refute the simplest state-

ment of the speaker. The arguments seem even more reasonable if the speaker affirms with much gusto, and dares his audience to deny them. Snap judgments are the result of reasoning from too few facts. Other things being equal, the one with the most experience in any field will do the best thinking in that field.

**Cause of Thot.**—When action follows directly upon the stimulation of a nerve there is no thot. If the action is in any way interfered with, it causes one to stop acting, but he will not necessarily think. There may be no neuron patterns into which the energy may flow and it will dissipate without action. If there are associated neuron patterns into which the energy can flow, there will be action.

As we saw earlier in the chapter, one may choose between two ideas which he has in mind and not do any real thinking. One will not *think* until he strikes some obstacle which at the moment seems insurmountable. There is a tendency for the mind to rely upon the lower mental processes just as far as possible. In such a situation one recollects as far as possible all previous modes of action, but finds no choice that will meet the situation. He may then do nothing, just give up. On the other hand, the obstacle may arouse an interest which will lead him to an increased effort and finally to a solution of the difficulty. The broader one's experience the more apt he is to find a solution. If he has no experience, he will do no thinking.

One may have trouble with his car. It stalls. He tries to start the motor but it will not go. He looks to see that there is gas in the tank, that the electric connections are all in order and does all the other things that one usually does when the car refuses to go. Then he may decide that the matter is beyond him and send for a garage man, but if he is miles from a garage, he will give very serious consideration to the situation. He will assume cause after cause for the failure of the

motor to start. That is, he will set up hypothesis after hypothesis and test each out in order to discover a remedy. This he does by eliminating all the non-essentials until finally he finds the seat of the trouble.

If the difficulty is in one's business, he must go thru the same process, or get someone else to do it for him. He may know that there is something wrong in some part of his business organization, but whether it is in the manufacturing or in the selling side of the business, he is not certain. He must then set up an hypothesis to account for what he knows happens and then test the hypothesis, and then repeat the process until the cause is discovered. By this means new knowledge is acquired.

**Thot Processes.**—Thot processes, then, are stirred to activity when one finds his way blocked, either physically or mentally. Then thru associative memory, one recalls all the remembered elements that seem to have a bearing upon the situation. Then a choice is made and if nothing satisfactory results, one is forced to quit or to deliberate. Up to this point the process is quite like memory. One looks over his past experiences in order to make a satisfactory choice among them.

**Original Thot.**—If one does not find the desired pattern among those called up in associative memory and he still persists, he may select a part here, another there, until a pattern is produced that meets the case in hand. This building up a new pattern out of different elements, results in original thinking, or in constructive thot.

**Dewey's Steps.**—John Dewey has analyzed the process of thinking and gives the five following steps which one must take in a complete thot process:

1. Recognize the problem.
2. Interpretation of the problem.

3. Suggested solution.
4. Testing the suggestion.
5. The acceptance or rejection of the suggestion.

**Acquisitive and Reflective Powers.**—Most of us are better equipped with acquisitive than we are with reflective powers. This is due, no doubt, to the fact that we, as a race, have been exercising the former for millions of years while we are yet hardly beginning to use the reflective powers. The student who thinks things out instead of committing them to memory is rare. Most of us find that we can learn history by heart easier than we can master the ideas set forth in the record of movements. The first method results in information but not in knowledge, and is of little value except to help us pass an examination that has been poorly set up. Many are inclined to commit the proof of geometrical propositions to memory instead of working out a proof of their own. It is because one acquires much better than he reflects.

The test of reflection is in the application of the result to actual problems. I have had many students who could apply the rule for square root if they only knew to what to apply it. They could find the square root of a number without any difficulty, but were never quite sure when the square root should be found. Because of their inability to reflect they never saw any relation between algebra and geometry, or between physics and chemistry. Getting knowledge in one field never threw any light upon any other field for them. Such seldom recognize a problem. They simply find themselves baffled, and try all sorts of ways of escape like an animal trying to find his way out of a maze.

Those are the persons who need so much supervision in whatever field they are employed. They know how to do some things but they seldom know when to do them. Hence, they

must be told. A large share of the cost of manufacturing is due to the fact that so much has to be paid for supervision of those who do not *think*. Of course, what is paid for supervision cannot be paid to the workers in wages.

**From Particular to Particular.**—We reason from one particular to another particular. I remember that it took me seven minutes to walk to the station yesterday. I infer that it will take me seven minutes today. I look at my watch and see that I have hardly seven minutes, so I hurry. I hear a knock in my motor. I remember that once before such a knock was caused by carbon. I infer that carbon is the cause of the present knock. If my conclusion should be disputed by anyone I refer to my particular experience to prove my conclusion. When we prove a proposition by appealing to a particular proposition, the process of reasoning is called *inductive*.

**From Particular to General.**—It looks like snow. I will get my overshoes. It looks like rain. I will get my umbrella. Because I have discovered that clouds that look like those mean snow or rain. I appeal in this case to a general proposition to prove my case. When we prove a conclusion by appealing to a general proposition, the process of reasoning is called *deductive*.

**Why Same Method Sometimes Leads to True and Sometimes to False Conclusion.**—I say this is an American Beauty rose because I know that all roses having the characteristics of this rose are American Beauty roses. You may disagree. If you do, it will be because you do not admit my premise. You will say that all roses that have these characteristics are not American Beauty roses, hence, this rose may be in the class that are not American Beauty roses.

Sugar is sweet. Saccharine is sweet. Therefore, saccharine is sugar, you say. I admit that your premise is correct, but declare your conclusion to be wrong. This, that, and the

other unsupported bodies have fallen. Therefore, this unsupported body will fall. I agree to the premise and to the conclusion. In both of these cases we have reasoned from true particular propositions. In one case we found a true conclusion, in the other a wrong conclusion. We go from observed likenesses to unobserved likenesses. One argues that sugar and saccharine resemble each other in being sweet, much as we remember that 4 cows and 4 horses and 4 sheep resemble each other in having the common element 4. The proof that saccharine is sugar is based upon the fact that both are sweet. He thot that one sweet thing—sugar—is a type of all sweet things. He argued that saccharine is sugar because it is one of a class of sweet things, all of which are sugar.

The case is quite different in regard to the falling of unsupported bodies. In that case he has observed that many objects unsupported have fallen and reasons that this one will because it belongs to a certain class of bodies having certain characteristics, one of which is to fall when unsupported. In regard to saccharine, he did not have cases enough to form an accurate concept of objects, a characteristic of which was sweetness. Therefore, in one case his conclusion was false and in the other it was true.

**Beginning of Thot.**—Certain assumptions are made at the beginning of thinking. We call them axioms. The essential quality is not that they are self-evident but that they are unproved. These unproved axioms, or primitives as they are sometimes called, lie at the foundation of every line of thot. To determine these axioms, or postulates, is not easy. For instance in mathematics, one mathematician postulates certain axioms, another, others, and a third, still others. They may all agree as to one or two, but disagree as to the others. In the field of theology one man sets up certain postulates, another, others, etc. But after the assumptions are made and

known, and we know what terms are left undefined, we must take all possible care to avoid contradictions. It is not dangerous to *thot* and conduct to hold any *one* notion, but it is dangerous to hold *two* contradictory notions. After a certain point, every step must be defined and proved with the utmost precision. There are so many conclusions because there are so many assumptions. These assumptions are important for they color all subsequent thinking.

**Necessary Beliefs.**—There are certain beliefs which we hold that we have come to regard as necessary beliefs. They are based, however, upon experience, and in the light of that experience we hold certain beliefs concerning the future. For example, I have learned that fire heats water. It did yesterday. It has today. I cannot conceive of its not doing so tomorrow, or next week or next year. I cannot conceive of its not heating water on the moon or any other part of the universe. We have seen the sun rise and set ever since we can remember. Will it rise tomorrow? We have somehow come to believe that in general what has been will be. That is, we believe the same causes will produce the same effects under the same conditions. Yet, we do not *know* that any of these things will happen as they have in the past. For all we *know* heat may freeze water tomorrow, but if it does it must change either the very nature of heat or the very nature of water. The two things cannot remain true to themselves and not react as formerly. Unless the past enables us to forecast the future, rational action would be impossible.

**Inductive Thinking.**—We have seen that when we prove a conclusion by appealing to a particular proposition, the process is called *inductive*. We made reference to this method when we were dealing with the formation of the concept and noted that there is great danger that we shall generalize too hastily. That is, we shall form a notion of a *class* without

having examined enough individuals to be sure we have found all of the essentials. The same danger is met with when we attempt to go from a particular to a general proposition. Perfect induction means that every case has been examined. One essential overlooked upsets all the logic ever applied. The farmer must know what is in every field, the housewife what is on every shelf, the druggist what is in every bottle, the librarian the place of every book or he cannot generalize with certainty. In induction we state all we know based upon our experience. We go from the particular to the general. Induction is the discovering of truth.

**Deductive Thinking.**—When we prove a conclusion by appealing to a general proposition, the process is called *deductive*, as we have already seen. Deduction is the classification and application of truth. In this instance we go from a general law to a particular case. In both instances we depend upon our experience. One will reason badly because he has limited experience. If one finds his generalizations often incorrect he should get more experience, re-examine his concepts, and judgments, acquaint himself with the experience of others.

**Judgment and Thinking.**—We have already seen that judgment is comparing and relating two concepts, as Iron—is—metal. We have also seen that the formation of a concept is a generalizing process. Induction closely resembles generalization, but in generalizing there is no going from the known to the related unknown, and hence there is no real thinking in forming the concept. Induction presupposes generalization. Reasoning does with judgments what in a measure judging does with concepts. It may help us to recall the process from sensations on. Sensations are the raw material out of which percepts are made. Percepts are the raw material out of which concepts are made. Concepts are the raw material out of which judgments are made. Judgments are

the raw material out of which conclusions are made. Reasoning is comparing or perceiving of relations among judgments. It is going from the known to the related unknown thru judgments.

**Laws of Thinking.**—*Parsimony*.—The law of parsimony is that one shall assume as little as possible. That is, the number of axioms must be the smallest possible. Causes must not be multiplied beyond the strictest necessity. We must not assume an unknown cause where a known cause will account for the phenomenon under consideration. For example, Kepler studying the movements of the planets came to the conclusion that the planets were alive and moved by their own volition and were watched over by guardian angels. Today we believe that he assumed two causes too many.

*Analogy*.—Analogy is direct inductive inference from any one fact to any *similar* fact. For instance, we draw analogies between the physical and the mental, and between the mental and the spiritual. Whenever two or more things have a number of points in common, we assume that they have more in common than we have yet discovered. So in reality, reasoning from analogy is based upon our ignorance and not upon our intelligence. At the best analogy only points to the probable. We often overlook this phase of the matter when, because a man is an authority in some field we assume he is an equally good authority in another field unrelated to the first. A few years ago a man who is a great expert in applying science in a certain field but who had never made a study of the Bible stated his belief in the literal infallibility of the book, and immediately those who agreed with him hailed his opinion with as much satisfaction as tho he had actually known something about the matter of which he spoke. They reasoned by analogy. If this man knows so much in applied science, he must know a lot about everything including the doctrine of the

literal infallibility of the Bible. He had made no study of the origin, development, and interpretation of the Bible. He knew nothing of the discovery, history, and translations of the thousands of manuscripts of the Bible in existence. Yet he was ready to declare his belief and those who held the same belief hailed him as a great authority. Reasoning by analogy is based upon ignorance, but many are not wise enough to know it.

**Simple Minded Cannot Test Truth.**—The simple minded do not know how to test the truth or falsity of a proposition. They do not know what *proof* is. They do not know what *evidence* is. They do not know whether or not a fact is relevant to the case in hand. They do not know the relation of cause and effect except in the most patent cases. They do not understand what an *explanation* is.

The untrained mind believes in many superstitions. The rabbit's foot, the Ouija board, clairvoyants, thirteen at the table, fortune telling are common possessions of the group. They do not know why they believe in these things, but they do. They want certainty, authority, assertion, something to tie to. They would rather pay \$50 to a quack who declares he can cure them *positively* than to go to a great physician like Dr. Carrel, who, because of his great knowledge, would be a bit hesitant about making such a bold declaration about what he can do. They put great store on the unusual. They do not get at the meaning of things. They do not infer. They follow impulses.

**Intuition.**—We often hear persons speak of new truth flashing into their minds as tho it came from somewhere without reflection. Such truths have been called *a priori* truths. There was a time, however, when *a prioris* did not exist. They have come into being. They are the results of previous attempts to think a proposition thru. Intuition is a product of

all of the activities of the intellect. *A priori* are not an endowment with which the creator has equipped man, but they are an achievement by man. They are the result of impressions left in the subconsciousness which later are brought into consciousness thru the proper stimulus. These intuitions have to be tested as do any other truth which the mind may hold.

To make an adequate test of any conclusion one must examine many cases. Are the churches a force for good in a community? One must investigate many churches and their communities before he can answer intelligently. Can diseases be cured by the laying on of hands? One must make many investigations as to what diseases were actually claimed to be cured. What were the diseases? Were cures actually produced? In these and similar cases the testimony of scientifically trained physicians must be sought because they are the only ones who can properly diagnose a case of illness. They may fail sometimes, but they know much more than the quack.

**Laws of Thot.**—There are certain fundamental principles which govern thot. These must be kept in mind when we attempt to discover relations. Judging is the direct discovery of relations. Reflection is the indirect discovery of relations, and when we think we have discovered a new relation, we must apply these fundamental laws in order to test the results. They are:

1. The law of identity. That is, whatever is, is. Everything is identical with itself. A is A and B is B.
2. The law of contradiction. Nothing can both be and not be. There can be no contradictory qualities. An object cannot be both black and white at the same time. The old Hebrew writer did not recognize this when he said, "All things are possible with Jahveh."

It is outside the reach of human comprehension that God can make a world flat and round at the same time. The old theologian settled this by telling us that that is one of the mysteries of God, but man does not know enough about it to even know that it is a mystery. To man it is utterly impossible. If the old Hebrew had said that Jahveh could do all that is possible to be done, he might have been correct in his statement.

3. The law of the excluded middle. Everything must either be or not be. There can be no middle ground. There can be no opposite or contradictory terms. A thing cannot be *hard* and *not-hard*. The other terms sometimes used are *hard* and *soft*. A substance may be hard according to one standard and soft according to another one, but it cannot be *hard* and *not-hard* at the same time because the quality is measured by the *same* standard. As Jevons has pointed out, the situation in logic is quite unlike the situation in mathematics. In mathematics a thing may be greater than, equal to, or less than another. There are three conditions which arise because of a standard which is not the object under consideration. In logic the condition is quite different because the thing is compared with itself. It cannot, therefore, be greater and not-greater than itself.

**Syllogism.**—Syllogism is the name given to the process by which two propositions are joined in thot. There are three terms, the major premise, or term, the minor premise, or term, and the middle term. In reflecting, we so unite the two premises that we are able to infer from them, by means of the middle term, a third proposition called a *conclusion*.

Formal logic, in which the syllogism is used, is a test of thinking. It is not a process of discovering new ideas. One does not really think unless as he considers the two propositions, he is led to recognize a need for the word *therefore*. Inference is always indicated by that word. If one reaches a conclusion without having use for the word *therefore*, he may be pretty certain that he has not been thinking but has jumped to a conclusion.

One may heat a bar of iron to 1000 degrees F. and find that it becomes luminous, or glows. He will then infer that any and all bodies of iron when heated to 1000 degrees F. will become luminous. If the situation is put into the form of a syllogism it will look like this:

Major premise—This bar of iron is heated to 1000 degrees F.

Minor premise—It is now luminous. Therefore,

Conclusion or inference—Any and all bars of iron heated to 1000 degrees F. will become luminous.

Here we infer a general or a universal law from this one experience. In other cases of different nature we might find it necessary to make many tests in order to be sure that we were dealing with the only cause sufficient to produce the effect under consideration. Having become **certain** about it, we would then be in a position to **infer**.

We saw in the last chapter that the imagination could not go beyond the particular, that it could not bind particulars into generals, or laws, that in order to form laws and principles we must appeal to another phase or function of the mind. That power is the ability to infer or to draw inferences. These inferences are then tested by the use of the syllogism.

I inferred a law from the effect of heat upon the bar of iron. I am quite certain that all men in the past have died. I am a man, therefore, I infer that I shall die. I have gone

beyond the particulars with which the imagination deals to a generalization or to a law which is, that all men die. When we have reached such an inference, one that finds no contradiction in our minds, we have found real satisfaction.

**Arrested Thinking.**—The paths of progress of the race are strewn with examples of arrested thinking, cases where men have that a process almost to completion and then for some reason have failed to see the connection or the relation to the next essential and have apparently failed, and the world has waited for years, sometimes for centuries, for someone to pick up the trail and follow it to the end.

The Chinese printed from wooden blocks in the tenth century, as the Romans printed from dies on their coins in the first, but neither of them were able to generalize enough to make the process really usable in any large way. The world had to wait until the fifteenth century for the art of printing as we know it.

In 1714 Henry Mill made an invention and took out a patent on the forerunner of the present typewriter, but nothing ever came of it because of the inability or the opportunity to make the necessary inference and apply it. After a hundred years a "Typographer" was invented and patented by W. A. Burt, which became the immediate forerunner of the modern typewriter.

Years ago in Australia when the wheat crops were too large to be harvested, a man by the name of Ridley invented a machine called a "stripper" or header, which greatly reduced the need for manual labor. Ridley had read in an old encyclopedia about a reaping machine which had been used in Gaul centuries ago and which had been described by Latin writers on agriculture. The old Gaulish inventor was not able to make his inference practical enough to warrant the world in continuing its use.

Men exercise ingenuity in the presence of forced needs. When slave labor bears down the world because of its cost and inefficiency, a necessity arises that calls for the best thinking of men. Power is needed to take the place of the muscle of men and of oxen. Then Watt discovers the expansive power of steam and makes its use practical. The world faced another necessity. The new power resulted in a large increase of manufactured goods. The industrial revolution was in process. The demands for raw material and for the distribution of the finished products called for attention. Robert Fulton invented the steamboat, George Stephenson the locomotive and the transportation of the world was put upon a new basis.

It has been a long way from the windmill to the screw propeller, as it was a long way from the paddle to the side-wheeler. It is only in quite modern times that perception of similarities has been a force in making inventions. We have finally come to believe what Bacon said in the seventeenth century, that we cannot conquer nature save by obeying her laws, and we are coming to realize that when we speak of nature and nature's laws what is meant is that law is the formulation of the method by which things operate, and that in essence all law is the same whether it deals with the physical, biological, sociological, or psychical.

**Finding Reasons For Things.**—It is not always easy to find a reason for things. I mean a real reason. Of course, *proof* of what we believe is easily obtained. One can prove from different authorities that slavery is right, that drinking is not to be condemned, that our neighbors are those of our own set, that it is not wrong to hate our enemies. But these are proofs that do not prove. No sensible man today believes in human slavery, no matter what authorities may say, nor does he believe it right to sell diseased meat to the foreigner

in his town, altho in the past his religious teaching may have sanctioned it. We are beginning to see that in reflection one must go beyond the range of all authority to the facts. We must go to the expert for the facts, but we shall reserve the right to carry on our own reflection and reach our own conclusions.

Let us turn from the questions of belief to something that may seem more practical in the field of reflection. Suppose you were asked to tell why the city of Buffalo was built where it is. What reasons could you give that would account for it? You are seeking for causes to account for certain effects—the city of Buffalo in its present location. When you have answered the question in regard to the location of Buffalo, answer the same question in regard to Indianapolis. Johannesburg. Suppose you were asked to state whether such a person as Jesus ever lived. Here, as elsewhere, you would need to get all the information possible before answering. After reading all the books on both sides of the question, you would, without doubt, come to the conclusion that such a person did live. You could answer intelligently because you had the facts, and saw the relations.

**Why Men Differ in Their Thinking.**—As we have already noted, the reasoning process may be correct, and the conclusion wrong because one of the premises is incorrect. Two men argue about a ship subsidy. One starts from the premise that anything that will increase the number of American ships is a good thing. A ship subsidy will increase the number. Therefore, a ship subsidy is a good thing. The other man will deny the major premise. He will say that if foreign ships will carry our goods at a lower rate, it would be unwise to increase our rates just to put money into the pockets of a few American ship owners, that increasing the number of American ships is not under all circumstances desirable.

The same thing holds in regard to the programs of political parties, so far as they have any beyond a plan to get the votes. The problem of the tariff, of Strict and Loose construction of the Constitution, home rule, etc., lead to different conclusions because men argue from different premises. We see the same thing resulting in the labor world. Men see only one side of the proposition, and so often accept unwittingly a wrong premise, and hence, reach a wrong conclusion and trouble results in the industry.

**Use Reason in Acquiring Knowledge.**—One should always use his powers of thought in acquiring knowledge. Always ask questions. Always ask, *why?* Do not accept the conclusions of others without question. Find out what their conclusions are, then find out *how* they reached them. The *means whereby* a conclusion is reached is of more importance to the thinking person than the conclusion itself, and when you state a conclusion of your own always stand ready to explain the premises from which you derived your conclusion. Above everything else be tolerant. Not only be willing to put up with the other man's views but also give him as respectful a hearing as you wish for yourself. Know what you are seeking. Have a clear idea of what you are aiming at. Learn what others have discovered in the same field so you will not waste effort. Remember the intellect is invisible to him who has none. Do not try to compel others to accept your conclusions. If you succeed you will make a slave of one of your fellows. Try to be accurate in all things, but remember that the most successful men, the men who will live thru the ages, have been, not those who have been able to measure accuracies, but those who have been best able to weigh probabilities.

**Logical Powers New.**—Logical reason is a recent acquirement of the race, so it is quite natural that we should find a tendency to rely upon the lower mental processes so long

as they meet the demands and a little longer. When they fail we turn to the reflective powers. The mind has more affinity for objects than it has for concepts and principles with which reason deals and we appeal to them only as a last resort. It is this that makes it hard for us to get out of the humdrum of life and into the atmosphere of great ideas. It is the efficient mind that discovers differences in situations. Many must follow rules, take orders from others, serve because they cannot interpret experience. The genius may see deeper meaning of things but he has no extra talent. He acquires his knowledge by the application of the same principles the rest of us can use if we will. Let us try to see the deeper meanings, too. Let us think into things. "As a man thinketh, so is he."

A man should be judged, not by his caste or creed,  
The meat he eats, the vintage that he drinks;  
Not by the way he fights, or loves, or sins  
But by the quality of the thoughts he thinks.

## CHAPTER VIII

### WILL AND HABIT

IT is difficult for us to learn that the universe is under law so far as we are concerned. We recognize it when others are concerned but when it comes to us we often think that in some way we can "get by." Others who violate the laws of health are sure to have to pay the penalty, but with us it is quite different. We can violate the same laws and expect to escape the effects. Others are foolish if they invest in wildcat investments. They deserve to lose their money, but we have inside information. Others cannot get something for nothing but we often act as tho we thot we could. We still take a chance instead of recognizing the law. "What one sows, he reaps" is applied by us to the other fellow, but we think we can reap what we have not sown, or sow and not reap. Others may get caught in the meshes of the law but not we. We know a short cut, and so on.

But there is no law that is so inviolable as "Whatsoever a man soweth, that shall he also reap." Law must be obeyed or we must take the consequences. It matters not whether it deals with business or with mental development. Success does not come by chance; it comes as the result of earnest effort. If we succeed in making clear to you that the law of compensation always holds; that the laws of mental development never change; that men do not become wise just by wishing, but thru sincere and continuous effort, and can make plain the way in which that effort must be expended in order to secure

the best results, we shall have accomplished a most satisfactory result.

We have seen how the mind operates in producing percepts, concepts, judgments, etc. We have seen that memory, imagination, reflection are carried on according to certain laws or principles. The question now is, "Are we applying those principles in our own cases, or are we just reading *about applying* them?" A rule is of no use unless used. That is, we come to face the question of whether as a result of our study we are modifying our method of action or are going on in the same manner as before.

**Actions.**—We judge men by their actions. If one sticks to a task until it is completed, we say he is persistent. If one proves honest and truthful, we say he is reliable. If he keeps his head in emergencies, we say he is self-controlled. We act today as we do because we acted as we did yesterday and how we shall act tomorrow depends upon how we act today. We have seen that as one thinks, so he acts. If his thinking is inconsistent, inaccurate, his acting will be hard to foresee.

**Will and Action.**—Will and action are closely related. Will concerns itself with action. We determine, or will to do, and then act. When we "determine" there is an energy released that tends to find expression in action and this process may be repeated so often that when an order is given, we act without conscious decision, or determination. I recall a man in my home town years ago with whom the boys used to have sport. He was a veteran of the Civil war, having served for nearly four years. He enlisted when he was sixteen or seventeen years of age. During the four years, or so, of training, he became so machinelike in following commands that he would obey unconsciously any order with which he was familiar. He used to carry his dinner with him to his work and the boys used to torment him by catching him leisurely walking along,

unsuspicious of any attacks or orders. Then one of them would call, "Attention," and instantly the man would stand erect, arms at his side, and the dinner pail would be dropped, and often the food spilled upon the ground. The ideas which the command aroused controlled his actions. It took almost as much time and effort to train himself out of obeying commands as it did to acquire the ability to obey instantly and automatically.

**Will and Motive.**—Motive is the thing that beckons us on. We used to regard it as something that drove us forward. It is the object of desire, the thing to be attained or secured. The idea which has become the supreme object of our desire we call our ideal. It is our conception of how things ought to be.

The will is closely related to the motive because it determines which motive shall become the strongest by selecting the idea that shall be allowed to hold the field of consciousness. The idea that we select for the field of consciousness receives all the energy that can be released. We have seen that every idea, when it comes into consciousness, releases a certain amount of energy and that the energy tends to impel to action. Thru attention the will can put energy into a motive and make it effective.

**Will and Neurons.**—One's will depends upon his neuron patterns and they depend upon his inheritance and training. If one has had little training or a very limited experience, his neuron patterns will be few and not very complex and his responses will be in accord with them. If there are no clear cut pathways thru the jellylike substance of the brain, there is bound to be a weak and vacillating will.

We see this is true when we recall that one's ideas depend upon the association of neuron patterns. The more complex the patterns are, the more ways of escape there are for any

stimulation. Where we find a person without ideas, he is weak-willed. He has no idea what to do in an emergency because he has no paths to follow. So he just stands in utter amazement. It is here that training in "life saving" and in "first aid to the injured" proves of so much value. Sets of neuron patterns are so well worked into the material of the brain that in case of accident these patterns are at once aroused and action follows, while the one without such training stands by utterly helpless, altho earnestly desiring to do something.

Children and feeble-minded are led astray because they do not have a good stock of neuron patterns and so, not being able to arouse ideas in opposition to the suggestions made, do the only thing that seems reasonable to them, follow the suggestions. They are as easily led by good as by bad suggestions.

**The Will.**—Let us now inquire a little into the nature of the will. Will is so closely related to the other powers of the mind that we cannot find the line of demarkation. The blending or overlapping of these powers is like twilight. We cannot tell at just what instant of time it ceases to be day and becomes night. There is a twilight zone in which it is neither day nor night. It is like trying to determine just the instant a youth becomes a man. We know that day does pass into night, and the youth does pass into adulthood, altho we cannot tell the exact instant. So we find all the powers of the mind intermingling and overlapping. Feeling, willing, thinking are all present in every mental reaction. Sometimes feelings are aroused to such a pitch that both the other powers are almost, if not quite, in abeyance, and so with the other powers.

I think we may say that will is the motor element in feelings and in reflection. Will seems to be the whole mind in action. It may be in action with respect to something external which we call its environment. It may be an action in response to some reflection which at the time was not caused by external

environment. We may call such an instance a response to an internal environment. That environment each one builds for himself just as he interprets the external for himself. No two persons interpret the external environment the same. No two make the same interpretation of the same neighborhood because the internal environment of each is different. One sees in his environment things and influences which another does not see at all.

**Types of Will.**—As we study people, we see there are several types of will. By this we mean that while the essentials of the will are the same in all of us there are certain elements exaggerated in one, and other elements exaggerated in another. There are three types generally recognized. They are:

(1) *The Explosive.*—This type includes the dare-devils. Those who seem never to sense danger. Others may be killed but they will not be. They never debate, never hesitate. They act upon impulse, upon one idea like the boy who threw the stone and broke the window. If such can be led to reflect, they often lose courage completely.

(2) *Obstructed.*—This type includes the over-cautious. They are so afraid of doing the wrong thing that they do nothing. The impulses are seldom strong enough to secure effective action. They can find so many reasons why they should not act. They believe in letting well enough alone. While those of the first type are not deterred because others have failed, those of this group are deterred for that very reason. They are like the turning of the tide. You cannot tell whether it is ebbing or flowing.

(3) *Normal.*—This is a combination of the two. The average man who weighs carefully but who acts at the proper time. He is the man of balance, one in whom the spirit of caution and the spirit of combat are well blended. He realizes

that one who never makes mistakes never makes anything, so exercising a reasonable degree of caution, weighs all factors carefully and then acts.

**Will and Habits.**—Will-power is a habit. One who has formed the habit of acting upon every good impulse, has a dependable will and is acquiring increased will-power. One acquires that habit by making action follow closely upon the heels of decision until the habit has been firmly formed. Decision is built up out of thousands of little tasks actually performed, not by thinking about performing them. Unless these little tasks are done, no great one will ever be. Unless one forms the habit of acting upon the minor or less important decisions, he can never hope to arise to action upon great and important questions. Crises do not make heroes. They just present them to view.

**Habits.**—Habits depend upon the fact that the nervous system tends to act as it has acted before. Our habits depend upon what we do and what we have done. Habit is our customary way of doing anything. It is the way things *have* themselves. No habits are ever formed except by action. One may think often of doing a thing, or of forming a habit of this or that, but without action the habit is never formed. As we saw in an earlier chapter the mind expresses itself in bodily activity and it can express itself in no other way. The only habit we can form by doing nothing is the habit of doing nothing. Habit is action performed with the least amount of consciousness possible. We can do a thing so often in the same way that it becomes purely automatic. The only thing necessary to secure the performance is to start the process. It completes itself.

**Basis of Habit.**—The basis of habit, as has been intimated, is in the brain patterns. Hence, there is a physical basis for habit and the more perfectly the physical man func-

tions the more satisfactory service he can secure from these processes which he turns over completely to habit. We should make habits our servants and not allow them to become our masters. That is, we should not turn any of our ways of doing things so completely over to habit that we lose the right to choose to do differently on occasion. Habit tends to make us what our actions are. We judge men by their actions because we go on the supposition that one acts as he does because he has sometime, now, or in the past, chosen so to act. So we see the man in the act. Someone has said, "A man's actions are a picture book of his creed." You do not need to ask a man what he believes about many things. Live with him a while, study his actions and reactions and you will know what he believes.

**Forming Habits.**—Most of our habits are formed with little or no thought. Impulse is at the foundation of much of our life as fixed by habit. This is very unfortunate. Someone should have given careful attention to the formation of our habits. We were too young to sense the importance of the right way of doing things. But now we can see that in early life is the time when deliberate attempts should be made to direct the formation of habits. Time to the child in early years is of little value. It is the time when all the time-consuming habits and processes should be firmly fixed in his nervous system. Well formed habits of eating, sleeping, playing, dressing, working, handling tools, etc., should be made as nearly automatic as possible. This enables one to turn over to the lower nervous centers the performance of the routine things of life. A nervous system that functions properly is a great asset to anyone. It is an important factor in self-control.

Whatever acts are likely to be repeated often should be carefully thought out so as to decide upon the best way of doing them so that from the first time the best way may be followed

and made automatic. The difficulty in forming a habit that is not the best way of acting means that sooner or later we shall want to change. We can change and get on very well, but when a crisis arises or we are a little over fatigued the old habit arises to claim its mastery over us and we surrender. The old brain paths were deeply laid as they should be, but they were wrongly laid as the should *not* be.

**Economy of Habit.**—We all know that conscious attention to any detail for any length of time is fatiguing and when fatigued we lose interest. We are so constituted that we shift from the conscious to the subconscious processes just as fast as possible, and on the way from the conscious to the subconscious is habit. As we have noted walking, eating, dressing, etc., are all habits. These often are carried on with scarcely any attention because they become so nearly automatic. We know of persons who have walked in their sleep and talked in their sleep being completely unconscious of doing either.

The reason that it is economical to form habits is that after the habit is formed any stimulus that disturbs the sensory nerves does not need to travel to the brain. The path has been traveled so often that when a ganglion in the spinal cord is stimulated it seems to know what answer is to be returned. It is as tho a minor employe in the office would say, "You need not wait to see the head man. I know what he will say. Go ahead and do it." So the ganglion having been aroused so many times by similar stimuli and always having received the same answer does not wait for the message to go to the brain and back but orders action at once. This saves time and energy and often without arousing consciousness at all. Hence, habits simplify life by making it, to a degree, automatic.

The difficulty with many persons is that they cannot leave things to habit. They must give conscious attention to every

detail and this wears them out. Neurotics and neurasthenics are in this class. They just cannot let go of anything. The result is that physically and nervously they are constantly below par. They cannot sleep. They cannot lie down. They cannot sit up with comfort. They are never at ease.

**Habit Formation is Progressive.**—Habit formation constitutes the essence of education and should be done in childhood, as we have already noted, but if one has not formed right habits while young, he should form them now. It is better late than never in forming habits. A successful business man has acquired a certain attitude of mind. The educated man has acquired a certain type of mind, certain hopes, ambitions, and desires and these he has been acquiring thru the years. They did not come to him ready made. He has made them habitual. You can do the same by serious devotion. Men do not form valuable habits and set right ideals without care and devotion. We hear it said that a certain man is devoted to tennis, another to baseball, another to his family, another to literature, another to business. These devotions are all in the line of progressive habit formation. We do not so often hear of men being devoted to a life of morals, ethics, and religion in the sense that they are devoting all their energies to the attainment of a splendid character as others are to the development of a business. One makes habitual whatever he attends to. Practice makes perfect. Someone has said, "Young man, be careful what you pray for. When you get old you may get it." This is true with regard to habit. Indifferent prayers are often answered. Devotion brings its reward.

**Some of Our Habits.**—Many of us are possessed of certain habits that we rather enjoy, and yet many of these habits are a clear indication of our slavery to custom. We are quite inclined to believe a thing today because we believed it yester-

day. We have had some experience that makes us different than we were then but we are quite satisfied to let well enough alone. We are all quite inclined to exaggerate the amount of work we do and the number of hours we work. We are all a little inclined to brag about how early we get up, etc. We reason often from insufficient data. Our logical processes may be accurate, but our facts too few, but why bother about a few facts. We are willing to accept the conclusions of others about politics, business, religion. We talk continuously about being consistent without realizing that to be consistent is to be everlastingly inconsistent. These are all bad habits and most of us do not try to break them.

**Openmindedness.**—Openmindedness is a virtue in this as in every other day. So much is this recognized that many wish to be those openminded who have not those a new those in years and who have no patience with a new point of view. Such persons do not grow. They have become stunted in their mental life and do not know it.

Let us determine that we will not fall into such a group. The openminded man is always on the alert for new evidence bearing on the case, whatever the case may be. He is always on the lookout for information. He is not afraid of having his faith upset. He knows that we send boys and girls to school to have their faith upset. They go to college for the same purpose. Those who decry the upsetting of faith forget that all the advances civilization has made have come about because someone has been continually upsetting faith. They have upset faith in the old science, in the old politics, in the old economics, in the old forms of religion, in the industries, in the old business, in the old education and many of those who have profited most by the upsetting in one line make the biggest fuss because there is some upsetting in other lines, but the world moves on in spite of their protests.

Many of us acquire a stock of knowledge when we start out and then continue on thru life without much effort and little result in adding to that stock. But one must cultivate some intellectual pursuit or fall into a rut, and a rut dug a little deeper becomes his grave.

**Fixity of Habit.**—We ought to be able to inhibit the habitual when we desire. It is well for us to resign ourselves to habit if we are sure of the conditions in which we are placed, but we ought to retain enough control over even the habitual practices of life to be able to change when we find ourselves in new conditions. Children and feebleminded are seldom able to meet new conditions. They can be trained to do certain things under certain conditions, and it is a splendid thing that they can be so trained, but they are helpless when a new set of conditions arises unless someone is near to advise them what to do.

The neurotic person is in a good deal the same situation. His habits have become so fixed that he cannot abandon them. The past is his master. The neuron patterns of former days were so firmly fixed that he cannot respond to stimuli of the present except as he interprets them in terms of the old neuron patterns. He has suffered an arrested development in nerve impulse as the feebleminded has in neuron development. He has the years but not the power of adjustment. It is dangerous for one to live too long with yesterday, or to make too much of today. Yesterday and today should serve to inspire us for tomorrow and to release mental energy to enable us to conquer the future.

**Perseverance.**—Perseverance is prolonged effort with intervals of rest. It involves long hours and often many weary years to those who look on, but to the man who is in search of a great secret of nature, an invention, or a process, the years do not seem so long. One who has formed the habit of finding

an interest in the search so that he finds some satisfaction in the journey as well as in the destination is the one who perseveres.

Daguerre spent fourteen years trying to make the image remain on glass. He suffered and his family suffered with him. They sold furniture to buy chemicals and often went hungry, but Daguerre had set out on the "Research Magnificent" and he needed no urging. Fourteen years was a short time to look back upon in the face of victory. William Wilberforce arose in the British Parliament and moved that slaves in the British colonies should be free. No one else favored the motion. Each year thereafter for thirty-five years he made the same motion. The thirty-fifth year the motion prevailed. That seems like real perseverance.

We often hear persons say when listening to a great pianist, "I would give everything if I could play like that." But they do not mean it. They would not practice four hours a day for twenty years. One says he wishes he knew as much science as another whom he knows. Then instead of delving into science, he goes to the "movies." One wishes he could sell goods like the one who won the last prize. How much does he wish it? Enough to set himself at the mastering of all the fundamental principles of salesmanship and their application? Enough to learn every fact about the product and the processes that enter into its manufacture? Enough to learn every use for which it is designed and every purpose it will serve?

In most cases such as these what is really meant is that one wishes that he could have the rewards that come from perseverance without persevering. One would like to have the plaudits of the multitude without deserving them. Such a one is like the man who, being elected to public office, glories in the honor "thrust upon him" and then shirks all the re-

sponsibility that goes with the office. Perseverance depends upon will-power.

**Second Mental Wind.**—We are all familiar with the fact that often when we seem quite fatigued, we in some way or other pull ourselves together and go on at a more energetic and determined pace than before. We seem less tired than we were. It is with the mind as it is with the body. One starts to run a long distance race. After a few minutes he begins to feel fatigued, out of breath, and then all of a sudden he seems to take on a renewed lease of life. He breathes easier, his stride lengthens, and he really begins to run. It seems then as tho he could go on all day at that pace.

So with the mind. When one is paying close attention to a difficult problem of study or business, he begins to feel brain fag, tired, lazy, "all in." Then saying to himself, "This will never do. I must get this piece of work finished," he goes at it with a renewed energy that is double that of his previous effort.

These reactions indicate and a mental "second wind" is evidence that we all have more physical and mental energy than we ordinarily use or suspect we have. They indicate a reservoir of reserve power that we are not quite sure about. But the psychologist and the physiologist have learned something about them that are of value to us.

The physiologist has learned that certain glands of the body secrete and pour into the circulation certain fluids that tend to intensify action. These secretions poured into the circulation really furnish increased fuel for the muscles, and as a result they help "get up more steam." It is thru the emotions that these demands are made. Anger, joy, sadness, pleasure, prospects of success, all exert a strong influence upon these glands.

The psychologist has learned that these same emotions

arouse an increased nervous energy that may be poured into the brain areas when needed for thought and action. This energy arouses an increased number of associations, disturbs more neuron patterns, releases more ideas, makes the flow of ideas easier, and puts all of them at our immediate command. In this condition we go on turning out an increased quantity of work without the attendant feeling of fatigue.

**Fatigue.**—Fatigue is an attendant of continued exertion. It is partly a condition of the mind and partly a condition of the body. Often we feel tired all over. A large number of sensations come from everywhere. Our emotions are not easily aroused. Ideas come slowly. They are apt to be inaccurate, and we have no pleasure in them. Many times we are more tired than we think we are and often we are not nearly so tired as we feel. In such a condition the will-power is weak. It is difficult for us to determine *to do*. We are listless, indifferent.

**Cause of Fatigue.**—The exercise of muscles breaks down tissue and releases into the blood carbon dioxide and lactic acid. These are often referred to as toxic poisons. Through fatigue the cell body of the neuron, instead of being round and pinkish in color, becomes gray and reduced in size with jagged edges. There is an accumulation of waste products in the tissue of the muscles. All of these together produce the effect which we call fatigue. Rest gives an opportunity for the removal of these poisons and enables the body to recuperate.

**Massage and Fatigue.**—Massage is one of the best ways to remove the poisons from the system. Ten or fifteen minutes of massage will rest the tired muscles more than two or three hours of sleep. The physical trainer knows this and always makes use of massage upon arms, legs, and bodies of his men who are in training. What massage does is to hurry

on the flow of the blood that sweeps out the poisons which are destroyed on the way as filth is destroyed in running streams of water. With the toxic poison removed, the neurons can compel the muscles to do better work with less effort.

**Sleep.**—Sleep rests the nerves, but so long as ideas keep running thru the mind the blood is driven into the brain and that keeps one awake. Too much thinking or too much exertion tends to prevent sleep. If the blood can be driven from the brain, the neurons will be less disturbed and the person can go to sleep and secure rest for both muscles and nerves. It is a good plan for one who is inclined to be restless to do something to bring on muscular fatigue. The fatigued muscles demand blood, which will be drawn away from the brain. A hot water bag at the feet or a cold one at the head will help. A hot bath will drive the blood to the surface of the body. A cracker or two eaten just before going to bed will call the blood to the stomach and away from the brain.

Monotony puts us to sleep. We are not interested in what is going on. Hence, we are without interesting ideas at the time. The brain is not working. There is no demand for blood. The neurons grow pale and get sleepy and we follow suit, but let someone yell that the building is on fire and instantly we are awake. We can put ourselves to sleep by thinking monotonous thots, repeating the same thing over and over. Think of black or count. Of course some neurons of the brain never sleep, but the ones we think with do sleep in order to regain fresh vigor. Of course, when we are tired we are breaking down tissue faster than we are building it up. If we have sufficient sleep, we awaken rested and ready for a good day's work.

We have referred in another chapter to how one can awaken at a certain hour as he determines. One can go to sleep by a similar process. When it is time to go to bed even

tho he does not feel sleepy, but knows that he needs rest, if he will suggest to himself that is bed time, and proceed to deliberately get ready for bed saying to himself, "It is bed time. I am going to bed and go to sleep. I need rest and must get up refreshed and ready for a good day's work tomorrow." He will find himself gradually quieting down, the muscles gradually relax as he is preparing for bed, and by the time he is ready for bed he is ready to go to sleep. He has willed himself to go to sleep and he goes. The mental preparation for sleep is one that is often overlooked.

**Incentives and Their Power.**—Ideas release energy. James says, "The more the mind does, the more it can do." We all know that we can do more than we have ever yet done. We can know more than we know now. We can be more than we are. It is largely a matter of determination and of incentives. Under proper incentives one can do two or three times as much without getting more fatigued. Sidis, specialist in nervous and mental diseases, says he has never met a case of mental trouble caused by too much thinking or overstudy. Nervousness is caused by worry, emotional excitement and lack of interest in the thing one has to do. Then, it gets on one's nerves. We all know persons sickly and frail who have for one reason or another been obliged to assume heavy responsibility and we have seen them grow strong and rugged under the load. Crises not only draw upon what reserve power one has but they help to create new power.

**Lift to Higher Levels.**—One feels that he can do better and reach greater success if it is only worth doing, if the motive for action is sufficient, but he can make the motive sufficient. You form your own ideas. You select the material that you allow to form the basis of your conscious life so you can make the motive sufficient to require your best efforts. Having such a motive and then expending continuous effort in its attainment

will lead to a higher level of life, and in due time one forms the habit of living on that higher level.

Young people are quite prone when questioned about the things they do to ask, "What's the harm?" That is the wrong question. What should be asked is, "What's the good?" Is there anything positive, any really good thing to result? It makes all the difference in the world as to one's attitude toward the right ideal.

**Deliberation.**—What do you most desire in life? To answer that question requires intelligence. One must have some knowledge in order to give a satisfactory answer, whether it is about business, professions, or what not. Knowledge always arouses desire and desire indicates the path that is likely to be followed by the will. Deliberation is an important element in the matter. Suppose the matter comes up of my taking a day off. What is involved? There may be an excursion up the river. If I take a day off I can go. The fare is \$1.50. I am receiving \$2.50 a day. I shall not want to go alone. I want to take a young lady friend with me. That means \$3.00 for fare and lunches for two and some other little expenses plus the loss of a day's wages. If I do not take the day off I will save all of the prospective expenses and the day's wage. I must deliberate more or less in order to reach a decision that later I will not regret. Deliberation is a process of both the intellect and of the will. The intellect compares as we saw when we discussed the processes of judging. The will holds the ideas in consciousness or dismisses them. After I have deliberated, I must choose, decide. Decision is always the end of the process of deliberation and it always requires will-power. To be of any value, decision must be followed by action. Many make decisions and never carry them out. Action is the real end to be sought, not inaction. Resolves without action are worthless.

Notice, I said *action* is the real end to be sought. Many a person who cannot do as he would like to do becomes inactive. He sits and mopes over the fact that he has somehow been thwarted in his desires. The young lady would not go with him on the excursion, or something else goes contrary to his plans and so he is discouraged and disheartened, does not care now whether or not he works. He becomes inactive or very much less active. When the real remedy is to become even more active. If he cannot do as he had planned then plan to do something else. How many times I have known of persons who have planned a day's picnic and then it would rain and the day would be spoiled for them. They sat in a grouch all day, stormed worse than the weather and made everyone sour and sad. If they had only had sense enough to have made other plans when it began to rain and put their energy into increased action instead of grumbling and inaction they would have spent a happy day in spite of the storm.

**Inhibition.**—Of course one cannot do everything he thinks of doing. If every motor idea went into action, one could not live long. Everyone of us is familiar with the process by which we drop out of that many of the ideas that occur to us. We inhibit, restrain, or divert them into other channels and give them no further thought. Inhibition is a late acquirement of the race. In all the past ages the race has followed instinct and impulse without inhibiting any ideas. Savages, children, and imbeciles, cats, dogs, and other animals inhibit almost no actions. You pull a cat's tail just in fun and you get scratched. You step on your pet dog's toe and he will bite. Inhibition is at the foundation of self-restraint and of even temper, but coupled with the idea of inhibition, the not-to-respond-notion, should be the idea of do-something-else-notion.

**Will and Breaking Habits.**—Most New Year's resolutions consist of deciding to "quit." Quit smoking, chewing,

drinking, swearing, etc. Occasionally we decide to "begin" doing something. The first means breaking a habit; the second making a habit. We have learned long since that we cannot overcome a bad habit with nothing, that is, inaction will not succeed. The normal man is born to activity. There are at least four things that must come into consideration if a bad habit is to be broken.

(1) **Want to Break It.**—In all too many instances one would like the exhilaration that comes from the bad habit if he could only get rid of the effects that are bad or that his friends or employer does not like. But there is little prospect of getting rid of a bad habit until one definitely makes up his mind that he *will* be rid of it.

(2) **Substitute Another.**—Nature abhors a vacuum in actions as well as in material things. Life cannot be left with an "aching void." "The devil finds some mischief for idle hands to do" is psychologically true even tho the idea of personal devil has lost its standing in twentieth century thot. Are you going to break a habit? Have you made up your mind about it? Have you willed to break it? Well, and good. What are you going to put in its place? You must put something. You must decide what you are going to do in place of the bad habit, when you will do it, and how.

(3) **Do Not Worry Over the Bad Habit.**—Bad habits left to themselves die of "dry rot." Set yourself at the new task, the one you are substituting for the old. Give your attention to that and the old will disappear. Psychologists have learned that the continual "don't" to children is the wrong way to train them. Many children are brought up with a continuous string of "Don't do that." "Now, don't do that." The continual emphasis upon the negative arouses resentment on the part of anyone. Keep the positive in mind. Let the negative

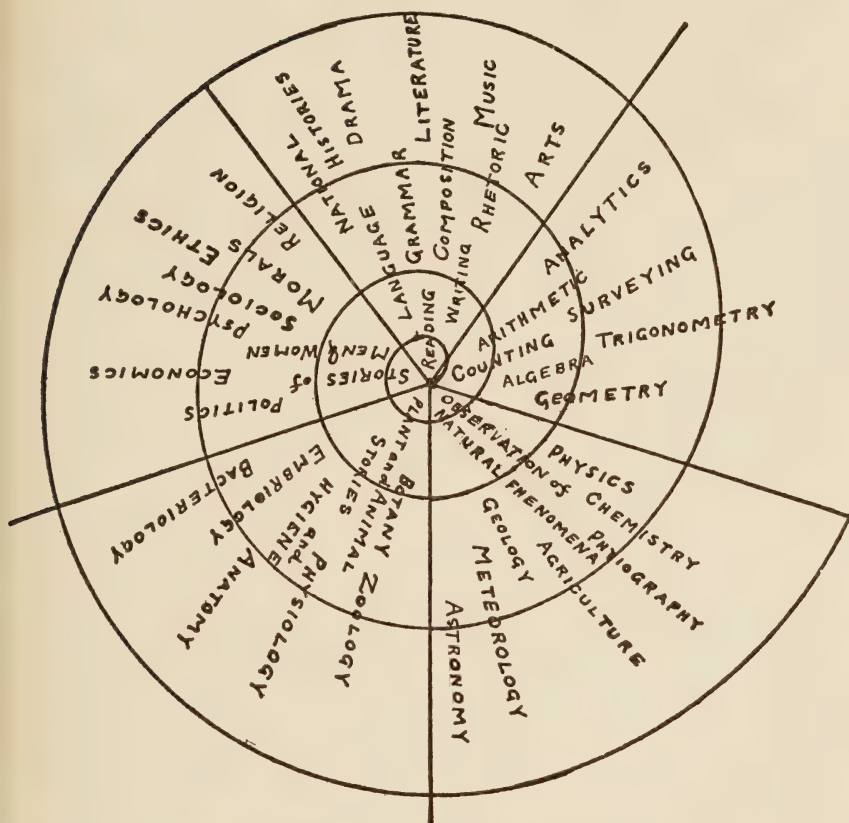
go. Instead of saying to yourself, "I am not going to get drunk," say, "I am going to keep sober." Every time you think of getting drunk, the idea of the liquor and its taste is brought into consciousness. We have seen that every idea releases an impellent energy that tends to find expression in bodily activity. Keep the positive idea in consciousness and that will tend to find expression in bodily activity and it will crowd the old idea out of mind and out of life.

**(4) Right Mental Attitude.**—The right mental attitude must precede the performance of the act. Not only what is to be done but the reason for it and the way to do it. Change of viewpoint is the only way to reformation and breaking old habits and forming new ones is a reformation, no matter what the habit may be. One must have, as we shall see later on, a conscious, reasoned control. The will holds in mind the result of reflection and opens the way to a new set of actions.

**Will and Knowledge.**—What one does depends upon what he knows and in general what one knows depends upon what he wills to know. Ideals grow out of ideas. One who has little or no idea of morals has no ideals into which moral ideas fit. If one is to succeed in business, profession, or in making an all round man of himself, he must acquire facts of knowledge and their relationships. One must increase his self-consciousness by extending his ideas. He must not only will to do this but must find the way to do it. If it is industry he must know the relation of all parts or departments to each other. If it is in the field of education he must know the fundamental principles of the various subjects and their relations.

The acquiring of this knowledge is not so much a matter of time as it is of method. For years I have used and recommended a scheme or plan of reading, somewhat as follows:

## THE FIELD OF KNOWLEDGE



The entire field of knowledge may be divided into five groups, viz. :

- 1.—MATHEMATICS
- 2.—PHYSICAL SCIENCE
- 3.—BIOLOGIC SCIENCE
- 4.—SOCIOLOGIC SCIENCE
- 5.—LITERATURE AND ARTS

Keys to the field of knowledge are :

READING

COUNTING

LOGIC

Each one of these groups may be divided into a number of subjects. For example, physical science may be divided into physics, chemistry, physiography, geology, astronomy, agriculture, meteorology, etc.

Each of these subjects may be subdivided. For example, physics may be subdivided into mechanics, liquids, gases, sound, heat, light, electricity, etc.

Every subject named in the chart and others which help to complete the subdivisions has a theoretical and a practical phase. The one who has profited most by his reading, study, and thinking, and is, therefore, the best educated, is the one who is able to make a practical application of the theory.

The heights attained by any people in both these phases in each division of the field of knowledge determines the degree they have attained in what is called civilization. The same is true of the individual.

No one can understand the present who does not know the past. Only those can foresee the future who understand the present in relation to the past, for tomorrow will grow out of today as surely as today grew out of yesterday.

If one is to be at home in the world, he must know the history of civilization. He must know man's changing conceptions of the physical universe, of his changing conceptions of his own origin, development, and destiny, his changing and enlarging conception of God.

I do not mean that each one shall aim to become an expert in every subject of each group, but I do mean that he shall aim to know the fundamental principles of each subject so he may know what a knowledge of those principles has contributed to the civilization of the race, and know the great men who have made the discoveries. He ought to become an expert in some line and know all that is known in that line.

The spiral on the chart indicates the advance the race has

made in finding itself in the world. The individual may locate himself in the same way.

An acquaintance with the progress of the race is possible to anyone who can read, "figure," and think logically, and who will give a few minutes daily to intelligent reading.

Let him begin by getting in mind the problems with which each group deals, and the same with regard to the various subjects in the group.

Then let him acquaint himself with the suggested solution of the problem, the principles underlying it, and the one who discovered the solution. In this way he will come to know the history of the subject as well as the underlying principles of it.

He will soon begin to discover relationships among the different subjects of a group, and a relationship among the groups. He is then facing the question of a *philosophy of history*. He will also find himself raising the question of his relationship to the physical universe, to his fellowmen, and to God. He is then dealing with the question of a *philosophy of life*.

Then let him familiarize himself with the "mountain peaks" of the history of ancient, medieval, and modern nations, remembering that we cannot separate a people from its geographic environment and account for its development, or lack of it. Favorable physical conditions precede commercial development; commercial development precedes intellectual development. Mercantile communities have always been conducive to the propagation of that.

In reading one should follow the spiral so as to get a somewhat balanced course, reading successively in each group. Even the one who has the advantages of a college education will do well to review the history of civilization, and to see the progress of the race from the viewpoint of his own life work.

For one to review his own educational history from the

viewpoint of his life work often reveals assets which have hitherto been unrealized. Half-forgotten truths stand out with a vividness that inspires to new and wider application. Often new truths burst upon one's vision, and so he makes his little contribution to the advancing civilization of the race.

For one who wishes to follow such a plan of reading I would suggest as a general introduction "Evolution" by Thompson and Geddes. As introductions to the other groups I would suggest the following:

Physical Science—"Matter and Energy," by Soddy.

Biologic Science—"Origin and Development of Life," by Moore.

Sociologic Science—"The Community," by Lindeman.

Mathematics—"History of Mathematics," by Ball.

Language and Literature—"Primer of English Literature," by Brooke.

As an introduction to ancient civilization I would use "Ancient Times," by Breasted. These may each be followed by general text books until one has completed the groups. To keep in touch with the advances of the day in these times one should read regularly a weekly like the *Literary Digest*. Of course one will know the language and literature of his own business or profession, and will make constant use of parts of the Bible in his religious life. This may seem like a large task but done regularly it is not difficult. It is a real joy to find oneself becoming acquainted with the best that has been thought, felt, and done, by those who have directed the activities of men, and remember that "He that willeth to do shall know" and knowing shall do more, and be more than is otherwise possible. The prize is in the race as well as in the goal. Have confidence in yourself, will to do, and move forward, as long as life lasts.

## CHAPTER IX

### INTEREST AND ATTENTION

EVERYONE is familiar with the use of the words interest and attention. We pay *attention* to things because we are *interested* in them. One attends to eating, drinking, dressing, reading the morning paper and scores of other things daily because he has more or less interest in them. In some activities, he has less detailed interest than formerly because by having paid close attention thru interest he has so trained the muscles of his body and the neurons of his brain that they will now act without so much attention. His interest may now be centered principally upon the end of the action and not so much upon the separate acts which lead to it. Habit has assumed, or has been given, control of the process and it is successfully carried out and the end in which he is interested thereby attained.

**Arousing Attention.**—One cannot tell just what is going to arouse attention. As one reads a loud noise may occur and it will demand and receive the attention for the instant. The booming of cannon, or a blast of dynamite arouses the attention and compels, for the instant at least, the attention. But other occurrences will produce the same result. The turning of the key in a door, when one does not know there is another person in the house, will startle one with so much force as to take the attention from whatever he is thinking of. A whisper to one asleep will often arouse him when a louder call and considerable shaking would not serve as well. Evidently the quantity and the quality of the stimuli have something to do

with arousing the attention. The directing of the attention is another phase of the matter which we must consider later.

**Stimuli.**—There are two sources of stimuli. Those external to the body which reach the brain by way of the special senses and those internal ones which are occasioned by the mind itself. There are those who claim that we have no power of choice; that we are a machine and nothing more; that when certain stimuli strike the sensorium of the body we must react; and that the same is true so far as all choice is concerned. I often wonder what kind of stimuli causes such thinking. Evidently the same kind does not produce the same result in all men, for there are many who maintain that they can choose; that they can respond to internal stimuli and pay attention to thoughts and things from which no external stimuli have recently come; that one can arouse by action of the mind things to which he wishes to pay attention. Both the mechanist and the vitalist, when facing a doubtful or serious proposition, *act* as tho they had the right of choice and are actually making up their minds.

**Choosing.**—No matter what his philosophy everyone feels that he chooses, even tho he may argue himself into believing that he cannot choose. He chooses the very facts and arguments with which he tries to prove his case. He has an interest in and pays attention to those only which meets his immediate needs. You feel that you can choose the events or incidents to which you will attend, and I feel the same; and when I say feel I do not mean the emotional only. I mean a feeling that involves a conscious certainty, one which my experience supports. When I am reading, I attend to a few items and omit many others. I attend to the thought of the author, but do not pay any attention to the quality of the paper, the color and quality of the binding, nor the publishers of the book. When I observe a landscape, I follow the same general plan. I select,

omit, enlarge my interest, increase my attention, withdraw it, place it upon something else and do it so often that I cannot believe that I am not free to do as I will in the matter.

**Epiphenomenalism.**—Epiphenomenalism is a term used in connection with a consideration of the directive tendencies of the mind which we have so far been regarding as consciousness. It regards these directive tendencies as essentially physiological, that is, that thought and consciousness can be fully accounted for in terms of physics and chemistry, that what we call purpose is an illusion. Those who hold to the theory of epiphenomenalism believe that consciousness is simply a reporter. It knows what happens within certain rather undefined limits but it can have nothing to do with causing the happenings. We just watch the machine go. They hold that consciousness is the effect of things but the cause of none. It is occasioned by the body but does not act upon the body. This would do away with purpose and choice. We are what we are because we are, they say, but this does not satisfy most of us.

It is known that the same stimulus applied to two apparently similar animals or to the same animal at different times evokes quite different responses. The reasons for the dissimilarity of responses are not mechanical reasons. J. Arthur Thompson says, "On the whole there is no evidence of real progress towards a mechanistic explanation of life." J. S. Haldane says, "There is in reality no experimental evidence whatsoever that the process (by which living creatures respond to a stimulus) can be understood as one of physical and chemical causation." By no juggling of words can we account for thinking in terms of matter and motion.

Whatever explanation may finally be accepted, if any ever is, we are quite sure that we know the mind thru bodily activity. We have already learned that the mind depends upon the body

for information about the external world and uses the body to express itself and that unless the body is in good condition the mind cannot make much headway in making itself known to observers. We all act as tho we believe in the possibility of the mind directing the body. In experience consciousness means active attention to the task being performed. This active attention seems to be a necessary condition of intelligence.

**Purpose.**—When we give time and energy to some plan or cause, we know that what we do is clearly actuated by some purpose. Early man felt the need of protection from the weather. At first he sought shelter in caves and behind rocks. The time was when a storm arose or winter came and he found it necessary, or at least convenient, to make something else take the place of caves or rocks. He acted to some purpose in erecting such protection. No one can make much sense of human life who does not recognize the part that purpose plays. Purpose really actuates our conduct and each one of us knows it, if experience teaches us anything. We recognize the anticipations of the future as an important factor in purpose.

One does not need to respond to every stimulus. One knows he need not react to every little irritation of the throat. He can control coughing. He can prevent winking, control swallowing, and many persons can slow the heart beat by paying attention. The results are brought about by psychical factors and not by physiological ones.

**Among Animals.**—As I sit writing this a dog comes running down the street. Just as he gets in front of my window a voice calls, "Here, Bowser, come here." The dog stops and acts as tho he is trying to decide whether or not he will go back. Presently he runs on and then the voice calls again. Bowser stops, hesitates, turns and goes slowly home. Who

shall say that interest, attention, and choice were not all involved in his stopping, turning, and going home?

A story is told of an Englishman who used to buy monkeys from the London Zoological Gardens. He would pay double the price for everyone he bought if he could take the monkey home with him for a few days before deciding. He trained the monkeys to be actors. He decided upon the ones he wanted by the way they paid attention to the tricks he tried to teach them. If he found the attention of one easily distracted, he would return him to the gardens. Such a monkey was not enough interested to make a good actor, but if one paid close attention and was interested in what was being taught him, he was bought at double the price.

Humans differ in about the same degree as do monkeys. There are some persons who cannot pay attention to anything except for very brief intervals. Children are interested in a dozen things where an older person is interested in one. We have the advantage of the monkey in one respect. We can reason matters thru and see what attention will do for us. There is no use telling the monkey what attention will do for him. Man can exercise his will power and increase his interest and attention.

**Things Attended To.**—Stern discovered thru many experiments that children at seven years of age are interested in persons and things, that at the ages seven to ten they begin to be interested in actions, and from twelve to fourteen they develop interests in spatial and other relations. At about fifteen and thereafter they become interested in qualities and properties of objects, and the more or less hidden relationships. They are interested in the search for unities. This is seen in the interest that develops in physical science. In physics up to this age boys are interested in the relation of pneumatics to hydraulics, the relation of heat to light, to sound, and to elec-

tricity, etc., but now they become interested in the relation of physics to chemistry, and the relation of these to biology. These new interests lead to some sort of a unified field of knowledge, an example of which we saw in the scheme for reading in an earlier chapter. Men are beginning to recognize the need of a similar interest in industry, one which shall enable each worker to see the relation of his part of the work to the finished article, a unity in diversity.

**Scope of Attention.**—Psychologists use a machine or apparatus with a disk which may be revolved at rapid speed. The revolving disk has slits in it thru which objects can be seen. The apparatus can be so timed that an exposure of  $1/100$  to  $1/5$  of a second may be secured, a time so short that the one tested does not have time to count the objects seen thru the slit. He is able to get only a glance, so to speak, of the objects. At best one can see and recognize only four or five objects at a time. It is interesting to note that while one can see only four or five objects, he can recognize four short *words* as readily as four *letters*. He may recognize more than four or five words if they are related so they form a sentence. The relation of the words to each other increases the field of “meaning” and thereby increases the power and range of attention. In our younger days we were taught:

One thing at a time and that done well  
Is about as good rule as many can tell.

This is discovered to be true in regard to the attention. One object at a time holds the center of attention, but that object may be very simple like a single letter. It may be more complicated like a single word. It may be still more complicated like a simple sentence. It may increase in complexity until it is a very complicated plan, the whole of which may be held in the focus of attention, but it must be maintained as a unity or the attention will let go of it.

**Attention and Bodily Accommodation.**—The body responds to the attention. When one going thru the forest is stirred by fear and his attention is fixed upon the sound which he hears and which he tries to interpret, he stands perfectly still, and breathes so lightly that he makes not the slightest sound. His muscles become tense and unconsciously his body accommodates itself to the thing to which he is attending. Even the glands of the body respond to the same influence. Under intense anger the adrenal glands pour their solution into the blood which energizes the man so he can do things which under more normal conditions he could not do. We try to fix our vision on a distant object. We pay attention to it. Immediately the muscles of the eye begin to adjust themselves to meet the situation.

Our interests narrow and our attention deepens under pressure. The story of Esau is an example. He returned from the chase hungry. His whole interest centered upon food and his attention was aroused to secure it. What was a birthright worth under such circumstances? What if he should starve to death while waiting for it? A mess of pottage was life to him, and so he traded the birthright for that in which he had an immediate interest.

From the physiological viewpoint attention is a flow of nerve energy into certain neuron patterns instead of into others, but beyond that it is a deliberate act of the will, or it may be occasioned by the attractiveness of the object which we call interest. We pay attention by looking, by listening, by smelling, etc., and when doing so refuse to pay attention to other sights, sounds, odors, etc.

**Selective Factors.**—We depend upon the sense organs for our knowledge of the external world. We have survived thru the years and the race thru the ages with only these few avenues of approach of the external world to the mind, or to

the ego within. We react to only a few of the stimuli which strike upon the surface of the body, only a few waves of the air cause sound, only a few waves of ether cause color, etc. The more clearly previous stimuli have been registered in the brain the more readily we pay attention when those same centers are again disturbed. A loud noise causes us to pay attention because of the intensity of the stimulation. A baby is not so easily disturbed by a loud noise as an adult is, because of the more completely organized nervous system in the adult. The more clearly an impression has been in consciousness, the more active the neuron patterns are when again disturbed, the more certain they are to arouse attention. We select within certain limits only. It is difficult for one to pay attention to the problem involved in trying to trisect an angle if he knows nothing of mathematics.

**Catching the Attention.**—Our attention is under ordinary circumstances caught by moving objects. We notice change, movement, music, odor, heat, cold, a stuffy room. I find in my own case that I have no difficulty in holding my attention to my work under almost any circumstances, but there are one or two things that always claim my attention and break any connection I may be following. One of those is when a selection from some well-known opera is being played or sung. "The Sextette" from Lucia will take my attention from almost anything I am engaged in at the time. A street piano may play for an hour and I will not be conscious of it, but let it begin the Sextette and immediately I am aroused to a consciousness of the music and my interest and attention are transferred.

We recognize movement before we recognize the object that is in motion. The threshold of consciousness may be a little lower in spots, so to speak, or for certain stimuli. A moving object in the early history of the race may have meant

enemies and we have learned never to be unconscious to their approach. It may be an animal good for food for which we have learned to be always on the lookout.

Confusion arises when the movements are too rapid to be attended to. One becomes bewildered and seems to pay attention to nothing in particular. Noise, fear, etc., often cause confusion, especially if we do not know the source from which they arise.

**Attention.**—Attention is the focusing of the consciousness. Any item of consciousness can become an object of attention. We *attend* to it. There is an inner activity in each of us which we command, of which we are master. There are two kinds of attention: voluntary and involuntary. The involuntary is more or less closely related to the reflexes, and the voluntary to the will.

The mention of Pershing, geometry, the north pole, or League of Nations gains your attention and gains it without conscious effort on your part, but if you continue to think of them you must give voluntary attention.

The first is called involuntary attention and is the result of the influence of the object itself. Voluntary attention is the result of a recognition of the relation of the object to something else. It depends upon the variety of one's experience and to some degree upon his mental development. Children and imbeciles are unable to give much voluntary attention because they do not see relations readily. Voluntary attention is governed by

a. Desire.

b. Interest.

c. Will.

To gain attention and hold it one, a teacher for example, must supply the conditions of attention. Those conditions are such

as will create a desire, arouse an interest, and secure the activity of the will.

My desire for listening to a certain speaker may be to learn something, or not to appear rude, or because I am to report later on his ability as speaker. I may attend because I have some interest in the organization for which he speaks. I may be interested in the subject discussed, particularly to see just how he handles it. I may not have any desire to listen, nor any interest in the subject so I just *make* myself listen.

**Interest.**—We have given some thought to the will in a previous chapter and will not repeat that here. The question of interest is of special importance in its relation to the attention. Interest is the tendency of the mind to find satisfaction in any subject when properly presented. It is finding some relation between an object and oneself. It seems to indicate a state of feeling, a going out toward the object. One has an interest in business, in education, in social position, and finds himself going out of himself, so to speak, toward or into the situation in which he has an interest. Real interests arise from activities put forth to secure the things desired. These efforts lead to self-expression. There is in each of us a feeling that we have the ability to attain, a sense of power, a sense of mastery. Interest springs from that feeling. To one who has lost his "nerve," who feels he is a failure, who thinks he cannot succeed anyway, there is no interest. To such a one life is a continuous nightmare.

**Effort.**—Desire leads to effort and where there is effort there is desire. They are two phases of self-expression. Desire in the form of appetites and passions is often uncontrolled. Then there is wasted energy, because self-indulgence becomes an end in itself. One can hardly conceive of the deadening effect of effort without interest. Prisoners breaking stones on the highway; men, for punishment, carrying stones from one

side of the road to the other and then carrying them back again are made desperate. When energy or hope fails drudgery comes in. It has sometimes been thot that the will was the only means of attaining the goal, that one must drive or be driven. But we have discovered that if interest can be aroused the goal will be more quickly reached and happiness and pleasure will be valuable by-products.

**Natural Interests.**—We should search for one's natural interests as a place to begin and make them the basis of the character we wish to see developed. In dealing with children, we should try to relate them to the life of their day so they may function as valuable members of society. This means that we must know what the requirements of their day are and how they shall be met. This will help us to know what habits and customs one should acquire and what interests he should develop. It will determine what he should be taught in school and what position he should be fitted to occupy in society and in industry.

We should follow the same plan with ourselves. Each one should make a study of his own most vital interests, discover how they fit in with the interests of his community, his industry, his church, his home, and what further mental equipment he needs in order to enable him to secure the fulfilment of his desires.

**Divided Interests.**—We hear much about singleness of purpose, and we know that there should be a dominant purpose, one vital interest in life in order to give much assurance of success. The business man who dreams of base-ball all the forenoon and then goes to the game and worries about his business while watching the plays is not making a very hopeful bid for business success. He is making a more certain bid if he forgets business entirely during the game and forgets the

game during business. It is a rare person who has several *vital interests* at a time.

Often there come times when men face problems of business when their *real* interests stand out with unexampled force. About three years ago a young man who had been in my psychology class the year before came to see me. He was employed by one of the largest corporations in the country. He had been offered a promotion to a position which meant quite an increase of salary. This position would let him remain in America. At the same time the company had offered him a position which would mean that he must go to China for three years. It would mean a much larger salary. He had a wife and two children. He could not take them to China and he could not bear to think of being away three years without them. We talked over the whole matter together. He said, "In a few years my children will be old enough to go to college and I must make it possible for them to go. I must earn more money. It looks as tho the China trip will help me more than to stay in America. I do not care to get rich, but I do want enough money to give my children every advantage possible. Ought I to sacrifice my own pleasure and leave my wife to take all the responsibility of them for three years and go to China?" I said, "All I can do is to help you get all the facts before you. You and your wife must finally make the choice." We parted. A little over three years later I was called on the 'phone and a voice said it was my friend. He had been to China, done a successful piece of work and had returned to take a still better position with the same company.

His case looked like divided interests. His one interest was his *immediate association* with his family. Another was to make more money in order that he might do more for them, but in reality his one *dominant interest* was his family. He had a secondary interest which was to succeed in his work in

order that he might accomplish the first object. He developed an interest in his task that enabled him to succeed and which led him to find an interest in China which he had not thot possible. Real interest arises from the identification of the self with the ideal, a satisfaction with the end to be attained.

**End and Means Often Not Close Together.**—The end and the means whereby it is to be attained are often far apart. It may mean three years and leaving the family for three years for a trip to China. Many cannot maintain an interest over so long a time. Their interests are continually shifting. They chase rainbows for a while and then give up and follow something else. We see that situation in industry today. It is a long way from the small piece to the finished article, so far that most workmen cannot maintain an interest sufficient to last thru. The finished article does not express the ideas of the workman, but of someone else and he has little interest in it.

I recall a young man who some ten years ago came to see me about some night-school work. He was a molder's helper in a gray iron foundry and was receiving good wages but had become dissatisfied and had lost all interest in his work. He could not see any future in the gray iron business. I asked him what he wanted to do and he said he wanted to study stenography. I inquired about his education and found he had finished grammar school and of course did not have enough knowledge of English to warrant his becoming an expert stenographer, of which I reminded him and tried to get him to see the time required to master English and stenography well enough to assure him a successful career.

Then I went back to his foundry work. I inquired how much he knew about the gray iron business. Did he know as much as the man he worked with? Did he know as much as the superintendent of the foundry? Was there any reason why

he should not know as much about iron as any other man in the business? To all of these inquiries he replied in the negative.

I urged him to study iron until he knew as much about the subject as he could find out from men and books. He decided to do so and began to get acquainted with the processes thru which the iron was put after it came to his foundry and why. Then he followed back along the line until he reached the mine. Then he became interested in the rocks in which the metal was found. He began to study geology, then physics, and chemistry.

His interest increased until the young man who thot he was in "a blind alley job" found himself upon the great highway of American mining, manufacturing, transportation, and trade. Six years from the time he came to see me he was the superintendent of one of the largest gray iron foundries in America. It was a long way from the position of molder's helper in a small foundry to the superintendency of the larger one. The means whereby he maintained his interest was thru acquiring knowledge. He was then able to sell his ability successfully.

**Training Interest and Attention.**—Robert Houdin was one of the most skilful magicians of his time, and he became especially interested in training his son in observing. This he did by arousing his interest and focusing his attention. He would have the little fellow observe a domino a fraction of a second and then tell the number of spots on the domino. Then the father would add another domino and so on until any twelve dominoes could be placed upon the table at once and with the merest glance at them the boy could name the exact total number of spots.

The degree of interest and attention developed was remarkable. The father and son then began observing articles in store

windows. They would walk quickly past a window and then stop and write the names of all the things they could remember. They kept this up until the father could write the names of thirty articles and the son forty-eight.

Taking this ability of the son into account the father decided he would surprise his audience some evening with it. So one evening when he was to entertain the friends of a prominent man at the man's home, the time came. As they went thru the library the father asked the son to notice some of the titles of the books and where the books stood on the shelves. Then when the time came Houdin said to the host of the evening, "I will prove to you that my son can read thru a wall. Will you lend me a book?"

Then in Houdin's own words, "I was naturally conducted to the library in question, which I pretended now to see for the first time; and I laid my finger on a book. 'Emile,' I said to my son, 'What is the name of this work?' 'It is *Buffon*,' he replied quickly. 'And the one by its side?' an incredulous spectator hastened to ask. 'On the right or the left?' my son asked. 'On the right,' the speaker said, having a good reason for choosing this book, for the lettering was very small.

"'*The Travels of Anacharsis the Younger*,' the boy replied. 'But,' he added, 'had you asked the name of the book on the left, sir, I would have said, Lamertine's poetry; a little to the right of this I see Crebellon's Works; below, two volumes of Fleury's *Memoirs*;' and my son named a dozen books before he stopped."

Of course the spectators were amazed. The instance shows that we may increase the power of attention by being interested in what we are trying to learn.

**New Interests.**—Many interests prevent narrowness. There is a tendency for us all to get narrow as we get old. As children we were interested in many things, as we grew older

our interests became fewer and our centers of interests became more definite. We were especially interested in *our* home, in *our* school, then in *our* class in school or college. We were interested in all the girls in our group. Later we became especially interested in *one* girl, then marriage, a new home, business, and by the time we reach thirty-five or forty years of age the dozen interests have given way to three or four at the most and we begin to get narrow. We lose interest. The father forgets he was once a boy, and so he loses interest in boys' interests.

Interest is the test of adaptability. Recognizing this tendency, we should aim to broaden rather than narrow our interests. New interests prevent rigidity of mind, and fixity of ideas. New interests are aroused thru new ideas and again we come back to the fact that "As a man thinketh, so is he." Unless one is constantly on guard to develop new interests thru new ideas, custom and habit will become as fixed as instinct and there results a rigidity of mind where no new ideas can enter.

The other day I came across the following poem which illustrates what the development of new interests may mean. A simple turning half way around aroused new ideas and new interests:

#### I WASH MY DISHES

Once I washed my dishes with my face to the wall,  
Standing before a dingy iron sink,  
My heart hot with anger against my fate;  
I thought I was made for better things than housework.  
So I raged, and consumed myself with bitterness,  
Until, one day, I turned around,  
And washed my dishes on a table, facing the window.  
Perched on a high stool, like a clerk,  
I looked over a meadow, white with daisies,  
(The farmer says daisies mean poor land)  
But to me the field was beautiful,  
Dotted with daisies and bright green weeds,  
Glinting in the sun like sword blades.

I feast my eyes upon them,  
While I wash plates and cups.  
I watch the long road that goes over the hill  
While my hands are in the soap suds.  
Automobiles rush along the road,  
Driven by people bent on pleasure,  
Or going to face death in hospitals,  
Doctors, on errands of mercy and healing,  
Business men meeting appointments,  
While I sit on a stool before the kitchen table  
Washing my dishes, and my thoughts rove over the world and  
beyond,  
To the land of the unreturning,  
For the cross road goes to the cemetery  
Where the one dearest to me lies asleep.  
I look at the bounteous sky,  
The hollyhocks by the fence, red and yellow,  
The gracious trees dotting the landscape.  
There is so much beauty in the world,  
My heart overflows with gratitude,  
As I wash my dishes.

—SUSAN RICE.

**Sources of Interest.**—There are three sources of interest :

1. The physical universe.
2. Humanity.
3. God.

**Physical Realm.**—We are all interested more than we often think in the physical realm. Our food, our shelter, our very life is very closely related and associated with it. We spend most of our time dealing in one way and another with it. Every process of the factory, every experiment of the chemist, every observation of the astronomer has to do with it. Every pay envelope, every purchase of food or clothing, every item of credit, every letter sent, every radio message received are indications of our interest in and of our dependence upon the physical universe.

We ought to be even more consciously interested in it than most of us are. No child ought to be allowed to grow up without experience in the application of some form of mechanical

power. We are living in a technical age. Our civilization has been reshaped in the last three or four centuries thru a knowledge of applied science. There is scarcely anything that so puts one at home with his own abilities and capabilities as to know he can control some power of nature and make it serve him, and this he should be made conscious of thru knowing mechanical processes. Every child should be taught to handle tools, and then complicated machines like the typewriter, sewing machine, bicycle, automobile, radio set, and then be made familiar with the principles involved. To one who has had such experience, the world is a very much more interesting place and his interests have increased in number and scope. He does not get narrow.

**Humanity.**—Humanity is a source of great interest to everyone but the hermit. Man is a social being. Industry, politics, religion are all based upon the recognition of the interdependence of men and women. Every boys' club, every Ladies' Guild, every Rotary Club is evidence of man's interests in men and their doings. Newspaper reporters are vigilant for human interest stories.

We think we are interested in ourselves, but how many of us are enough interested in ourselves to find out just what progress we make from month to month or from year to year in the efficiency with which we perform the work that falls to us? Have you worked out a series of tests that will show you how you progress? It seems to be a psychologically sound idea that no man for his own sake should be allowed to continue at a task when there is no further improvement possible for him. Interest cannot be maintained and the best effort of the man secured unless he can see some improvement in himself and in the way in which he does his work. This is a source of human interest, and when we have reached a sound view of industry we shall see that the biggest output of any industry

will not be the commodities shipped away but the men who remain. Making men is the biggest thing in industry. It is the biggest thing everywhere.

Think of your own work. Think of the way you did it last year and the year before. Are you doing it better this year than ever before? Are you a bigger man than last year? How do you determine? Do you determine it by salary? By quantity of work done? By the quality of work turned out? How do you measure the results? Do you think better this year than last? Are your interests broader? How do you determine?

I am often amazed at the inability of men to test their own progress, and yet I suppose I ought not to be. The situation is somewhat akin to making money. Most of us were taught how to earn money, but few of us were ever given definite instructions as to how to spend it wisely. Spending money would take care of itself. So most of us were taught to work or rather that we ought to work, but few of us were ever taught how to measure results, and yet in this day and age when the ordinary machine is adjusted to a thousandth of an inch, it does not seem amiss that men should discover a way of measuring themselves and their work.

It is not unusual for men to ask how they can turn failure into success. They do not know *why* they have failed and they do not know *how* they can succeed, but they have an idea that there must be some panacea which by paying a sum of money they may secure. It may be a psychology course, it may be this or that or the other thing, but until one has interest enough in himself to get acquainted with himself he will continue to wander around in the tall grass. These problems of humanity form a most vital source of interest.

God.—Every person sooner or later asks himself certain questions, such as, "Whence came I? Why am I here? Where

am I going?" Down thru the ages in one form or another these questions have been recurring. Man asks somewhat the same questions about the planet on which he lives and as his interest develops he acquires facts and then reflects upon them and establishes theories to account for the facts. In and thru and over all he postulates a being which he calls God. Every interest man has reaches finally to the great creator of the universe. Every problem of man and of the physical universe arouses an interest in the being and nature of God. Every man has some sort of a philosophy of life and each one involves these three elements or interests: physical universe, man, God.

**The Sentinels.**—Interest and attention are the two sentinels that stand at the entrance to the mind and determine which ideas may enter and remain. If one has no interest in a certain idea, that idea cannot find a place in consciousness. If one pays no attention to an idea, it will be bowed out of his mental presence. On the other hand, I often hear men and women wish they could get interested in this, that, or the other thing. They are like persons who wish they could meet the King of England, the President of the United States, Jack Dempsey, or Charley Chaplin. They cannot find a point of contact. There is no one at the door who will admit them.

One can find a way of meeting persons whom he wishes to meet and he can discover ways of developing interest in any subject.

This is of great value to one who finds himself obliged to do work which he does not like. If he realizes that in order to do the work well he must like it, and that he cannot like it unless he becomes interested in it, he will discover that he can develop an interest in it.

About three years ago one of the young men in my evening class in psychology came to see me. His father was a manu-

facturer and the young man had been a traveling salesman for the business. His father had told him he must give up the selling and learn the manufacturing end of the business so he could carry it on in later years. The young man was quite rebellious about it, and thot it most unkind of the father to insist.

I asked the son why he did not tell his father that under no circumstances would he go into the factory. He replied that he must do as the father said or his father would disinherit him. You see, he felt that he must accede to his father's demands, so I said, "If you *must* go into the factory, you must become interested, for life is too long for one not to like what he *must* do."

I suggested that he begin by studying every activity in his department, and its relation to the whole with the idea of improving the department, saying that inasmuch as he was going into it he must determine to succeed. He soon found himself intensely interested in what he did not like before because he had known nothing about it.

The last time I saw him he had been made assistant general manager of the entire factory. Instead of bemoaning the fact that he had to do what he did not like he had developed an interest and attention that brought happiness. He learned that if he could not do what he liked he must learn to like what he had to do.

**Concentrated Attention.**—Concentrated attention is an intense form of attention. It bars from consciousness every interest but one. Sometimes it becomes so powerful that an abnormal situation arises. Hysteria, anesthesia, amnesia, and the various phobias are expressions of concentrated attention. Hypnotism is concentrated attention. So unusual do these states sometimes appear that one who manifests them is spoken of as having a multiple personality, but we have seen that there

is only one mind in each of us no matter in how many ways it may manifest itself. What passes for a secondary personality is a symptom of a disordered mentality, or abnormal functioning of a normal mind.

Oliver Wendell Holmes said, "There are three of each of us. There is the man you think I am, the man I want you to think I am, and the man I am." Now I may pay so much attention to the second that I almost lose sight of the third. I may become so interested in appearing as I want you to think me to be that I become quite that person.

On the other hand, if I know that you think I am all things mean and disagreeable, my attention is quite likely to be focused upon those things and I become like what I have attended to.

Personality is developed by means of the things we attend to. It is a group of mental states bound together by memory. One's normal life and his normal memory are continuous. The mental states of the subconsciousness are contemporaneous with those of consciousness but are not connected with them by any recollection. This is due largely to the fact that little or no interest attached itself to them at the time of stimulation.

**Sustaining Interest and Attention.**—In order that interest may be sustained and attention developed one must get away from generalities to things specific, from the abstract to the concrete. He must continue to discover new details, and to fit them into the whole. One may not have much interest in the giant redwood trees of California, but when he discovers that when one of those trees was cut down it was found to have 2425 rings, which indicated that it was 503 years old when the Christian era began, 979 years old when the Roman Empire fell, 1995 when Columbus discovered America, he begins to be interested in *one* redwood. So it is with every question, no matter what it is. The interest is aroused and sustained thru

the recognition of specific details and their relation to the unit or object under consideration.

One must be interested in his employer's work as well as his own part if he is to succeed. Discoveries and inventions are made because of one's interest in plans and processes. The discoveries are not yet all made, the inventions are not all wrought out, altho men here and there often think the last word has been said and that all that is necessary now is to conserve and preserve the past. No one can continue to live on the successes of yesterday, no one can grow who thinks only the thots of yesterday. It is a fine thing to be able to point to a noble ancestor, but as Cicero indicated, it is better to become the noble ancestor of others. Pedigree may be a source of pride but it does not prevent a dog having tin cans tied to his tail. A glorious past is good, but a noble present is better. In which are you interested? To which do you pay most attention?

## CHAPTER X

### SUBCONSCIOUSNESS

A NUMBER of times in the preceding chapters we have made mention of the subconsciousness, or as it is sometimes called, the subconscious mind. In this chapter we shall give a little more careful attention to that phase of our life. We are all familiar with the fact that at no time are we using more than a very small part of our entire brain power, or brain patterns. We know that we have in mind now only a very small part of all that we know. This is often indicated by our expressions. We often ask for time to collect our thots, or when we have acted hastily we say we did not have time to collect our thots. We know that we have stored away somewhere thousands of experiences of which we have been aware in other days, but most of us are not so familiar with the fact that there are stored away somewhere just out of reach of consciousness many things of which we have never been aware, or to speak as the psychologist does, of which we have never been conscious. Less familiar are we with the fact that those things of which we have never known exert a strong influence on what we do and what we think. In reality, then, we see that each mind is composed, so to speak, of at least three phases, or states, consciousness, subconsciousness and unconsciousness. The unconsciousness being our racial and family inheritance with which we have never had anything to do and yet which is ours. The subconsciousness is the knowledge and skill which we have acquired and all of those experiences of which we have

been conscious but for the moment are not. Consciousness is the awareness of change.

**Cellular Intelligence.**—We learned in a previous chapter something about “cellular intelligence” and you will do well to turn back and refresh your mind in regard to it now. You will find that what we have called mind is very much greater in scope than we usually think it is, and that consciousness is only a very small part of the mind. We have seen that as life developed a sort of division of labor appeared, and one task was set off to one set of cells, and another task to another set, etc., and that the regular routine tasks later became a sort of second nature and the cells did the work without any “thot,” and so a part of the mind was set free to play upon other things or activities. Later these “other things and activities” of the mind suggested things to be done by the cells, or by the body as a whole and new actions and reactions occurred which in some instances at least resulted in the individual being lifted to a little higher level of life, or of “livingness.”

**Changes in Organism.**—These continued activities of the organism, no doubt, brought about some slight changes in the organism itself. These changes in structure, however slight, would in the long course of development be sufficient to account for instinct and reflexes. Of course we have difficulty in seeing these changes in structure in the higher forms of life because the generations are so long that we can observe only one or two or half a dozen generations at most, but if one could have a record of a thousand generations of some of the higher forms of life, such a record as a trained scientific observer would make, so that he could compare the last with the first generation, no doubt we would find important variations which have become hereditary. Anyway changes have occurred and these changes are inheritable and the functions of the organisms have changed with the structure. We know this

from the fossil remains of animal life such as the ancestors of the horse compared with the animals of the same line of descent that are living today and from the family of pine trees which have continued from carboniferous times until now.

**Nerve Memory.**—As this development has gone on many of the functions that once engaged the entire mind of the animal have been turned over to the subconsciousness and the process has been continued without disturbing the higher powers of the organism. This is possible only on the supposition that continued repetition of an action sets up a nerve and muscular memory, an association among the muscular fibers and among the neurons of the brain, which on stimulation repeats the process. This is true in the formation of habit and is probably true in the developing of instincts and reflexes. Because of this we can say that much that was once central in consciousness has in the long process of time lapsed, become submerged, or in other words, become instinctive.

**Types of Behavior.**—There are in humans all types of behavior or of reaction from those that require all the conscious power we have to those that require none, those that are carried on without our even knowing about them. We may pay as close attention to our digestive processes as we may, but we cannot tell just when the stomach has finished digesting a meal. We do not know whether or not the liver is at this minute secreting bile. The function is called into activity by a stimulus of which we, at the time at least, are unconscious. We do know when we do some acts which are called instinctive, as the bird knows when she builds a nest, and these acts we can control to a greater or less degree. There are other acts that have become habitual. When the stimulus is applied the organism completes the act without our giving further attention to the matter. Then there are those processes which are new to us, mental and physical, those which arise from facing

entirely new situations, environmental or other wise. To these we must give conscious attention. Mind has grown from the humblest beginnings to adult vigor by turning over to the nervous system as soon as processes have been mastered the more or less complete responsibility for carrying out the functions. The nervous system is the instrument for manifestation of what is or of what has been in consciousness, but so far as we know it does not produce consciousness.

**Mind and Growth of Organs.**—As we have seen the mind is effected by the growth of every organ. The psychic areas are closely related to the motor areas. Muscle culture develops brain areas as nothing else that we know of. Children thru imitation of the acts of their elders, thru performing the acts, develop the brain areas associated with the muscles exercised. We see how essential it is then that in the games and recreation of children such variety of activity shall be provided as will give the widest possible muscular activity. The child who has never learned to play has failed to bring many muscles into activity and as a result has failed to develop certain brain centers and is heading for a routine job in after life. He is bound to be narrow, unadaptable, and quite likely inefficient. He is altogether unconscious of the reason.

**Instincts.**—There has been no very satisfactory classification of the instincts, and no very definite line established between those reactions which are clearly instinctive and those that are the result of habit, between those that are innate and those that are acquired. There are, however, certain instincts that are closely related to self-preservation, such as fear and its attendant instinct flight, anger and its attendant instinct pugnacity. Of course there are those appetites which are instinctive which are also self-preservative, such as hunger, thirst, etc. Curiosity is closely associated with the instinct of fear. The first reaction to fear is flight. When the animal feels

itself safe it turns to investigate the cause of its fear, as we have often noticed when horses in the pasture have been frightened by a passing train. They will run toward the other side of the field and as the train passes and the sound becomes less loud they stop, throw up their heads, and watch it out of sight. In the course of time they come to feel safe and do not move as the train goes by. If in the flight of an animal it finds its way blocked, its flight hindered, it manifests another instinct, that of fight, and when one comes to feel that he can get what he wants thru fight, he is quite apt to become pugnacious and to play the bully until he is licked. Blocking of any instinct in man or animal leads to anger and to fight. It may not always result in fight, because man has learned that sometimes, at least, it is safer, better to control the impulse and thus lift the control from the subconsciousness of instinct to the conscious control of reflection. This is why the penalty attached to the law prevents many from doing the forbidden thing. Many a man is kept from stealing because of the penalty which will follow if he is found out. Many a woman observes the customary moral standards of society because of the social ostracism which will be visited upon her by other women. Of course reflection in these cases does not go very deep nor very far, but it goes far enough to help hold many persons steady who would otherwise follow their instinctive desires. In time these influences become so nearly subconscious that most of us do not recognize how large a part they really play in our lives. It is the power of the subconscious that I am desirous of having you become familiar with.

**Instinct and Intelligence.**—There are a number of theories in regard to the relation of instinct to intelligence. Lloyd Morgan thinks instinctive behavior is comparable to a chain of reflex actions, due to heredity. Bergson holds that instinct and intelligence are two radically different kinds of knowing. Stout

says that instinct is inseparable from intelligence. J. Arthur Thompson says that no mental state can be spoken of as solely instinctive or solely intellectual. He holds that innate knowing in instinct is of things, and innate knowing in intelligence is of relations. It seems likely in the light of our idea of cellular intelligence that Stout and Thompson hold the more nearly correct view.

**Instinctive Behavior.**—In instinctive behavior the organism uses its inborn organization and is able to adjust means to ends without exercising choice. The spider spins a web, the bee makes honeycomb, the Digger wasp paralyzes insects by stinging and then stores them away as food for its young, the Moorhen swims gracefully and well the first time. Instinctive behavior reaches its climax in ants, bees, and wasps. They are rich in instinctive behavior, but are almost non-educable, altho they do build up very complex chains of association.

**Intelligent Behavior.**—When we reach the higher forms of life, such as birds and mammals, we find they are less well equipped with ingrained capacities as indicated in instinctive behavior, but they are capable of a wide range of education. It is here that we may speak confidently of intelligent behavior. We see trial and error being used and profited by. Experiment begins to have a place in the activities, and with it some degree of reflection. It is a manifestation of the reflective and experimental as over against the reflexive and instinctive.

**Freedom.**—As this process of development goes on there is a continual increase in the degree of freedom enjoyed. The simplest organism is free compared with non-living substance. The dog is free compared with the starfish. The man is free compared with the dog. Each one is free to a degree, yet each is controlled to a degree by the experience of its ancestors and by its own, as indicated in the more or less permanent records made in its nervous system.

Primitive man was quite at the mercy of physical forces and quite as much at the mercy of the subconscious. Impulse and desire rather than reflection directed his activities. He imitated the group without knowing that he was simply an imitator, and so there developed a set of neuron patterns as a result of muscular action that later upon stimulation controlled him. It was to all intents and purposes a subconscious control. The only reason man could give for his action was "just because." The merest suggestion set the neuron patterns off and action resulted. Even today members of the race in general follow suggestions from others, usually the traditions of the past. Many are as much slaves to the ideas of their grandfathers as the Negro was a slave to his master.

**Wakefulness.**—As we have seen there are some organs of the body that are "awake" as long as life lasts. The heart is always active and so are the other vital organs of the body. Rest, meaning inaction, is unknown to most if not all of the organs of the body. So it is with the mind. It is always active, taking charge of these bodily activities, altho by far the greater part of its activities is quite unknown to us so far as actually being able to trace the process of the action while it is being performed. Sleep is a state of subconscious activity. The mental states of subconsciousness are continuous with those of consciousness, but they are not connected with each other by any recollection. Subconsciousness is like consciousness, except that it is outside the field of mental vision. The threshold between the two is not always at the same level, so to speak. It moves up and down. When one's energy is low the threshold lowers and old habits that have been buried in the subconsciousness for years and that we thought were gone forever reappear and often cause us humiliation. One falls into temptation very much more quickly if his vital energy is below par than when he is in the "pink" of condition.

This is a fact often overlooked by those who have charge of the training of children. It requires energy to set up new habits of thought and action. One needs to be well fed, well exercised, mentally and physically, to withstand temptation, or to prevent one from backsliding. The backslider is an example of one having apparently made up his mind to follow some new line of action, tries it for a short time and then surrenders to his former master, the subconsciousness. The relation between good health and morals and religion is very close and often overlooked by those who try to lead men and women to higher standards of life. A starving man can be "converted" to anything that promises something to eat.

**Subconscious Direction.**—The subconsciousness tends to go its own way and that way is not always the way we *will* to go. In such cases it continually checks us up by forcing rather gently upon consciousness a different thought. Often when we are looking for something we have mislaid we find ourselves "feeling" as tho we had left it in a certain place and yet we "half feel" that we did not. The "half feeling" is the subconsciousness trying to direct us the right way. We find the same thing happening over and over again when we are trying to recall a name. The conscious mind starts off on a sure course and is brought up shortly by discovering that way is not right and another closely associated either in time or place is found to give the correct approach to the name. We think the person's name begins with H, when in reality H was the first letter of the name of the place where we met the man. The correct impression was gradually pushed up from the subconsciousness.

**Making Use of "Stock-in-Trade."**—It is said by many psychologists that one cannot alter his subconsciousness. This does not seem to be the true statement of the case. One certainly can turn over to the subconscious many new impressions

and they will be registered there and become a part of the whole. These impressions are not something simply added as one adds a handful of sand to a package of sugar. The impressions are not simply poured in as one pours water into a glass, they become assimilated, associated, related to what is already in the subconsciousness and having been so assimilated the subconsciousness is different than it was before the process began. However this may be, one can learn to control and make the subconsciousness serve a helpful and useful purpose. When we recall that it is possible to make all our memories, impressions, experiences, in whatever line, contribute to our daily task by getting hold of them thru the subconsciousness, when we remember that all of our inheritances, dispositions, and tendencies, together with countless neuron patterns that have never yet been used for lack of a proper stimulus, can be aroused to activity and made to contribute to the task in hand we see how little of our real "stock-in-trade" has been made use of. It is as tho a business man were hard pressed for capital while he has money in the bank about which he has completely forgotten. This may seem a strange statement, but a few years ago I became acquainted with a man who had had just such an experience, discovering some years after his sore need of money that he had \$3500 in a neighboring city bank all the while and had completely forgotten it.

**Heredity.**—Thru heredity we receive our instincts and our nervous mechanism and to these we are continually adding experiences thru memories, the records of which are indelibly stamped upon the neurons of the brain. The subconsciousness operates thru the sympathetic nervous system and is most closely related to the instinctive elements of our nature. We hardly realize how permanently the neuron patterns, which give rise to instinctive functioning, must be registered in the brain until we recall that during surgical operations ether, chloro-

form, and other anesthetics do not prevent the mind from carrying on the regular vital operations.

**Lower and Higher Levels.**—We often speak of the lower and higher levels of the mind but it seems to me that such language does not make the matter quite clear. I think we shall get a better understanding of the situation if we consider the question, not from the viewpoint of lower and higher, but from that of permanent and less permanent. If we think of the impressions made upon the neurons of the brain as tho they were cut in as an engraver cuts with a tool, we shall realize that the deeper the markings the more permanent they will be and that the nerve energy will flow first and last thru these deeper impressions. These deeper patterns correspond to the pathways of the energy that result in functions which we regard as instinctive. Other impressions that are not so deeply carved are those that are acquired thru experience and these form the basis of habits, every repetition of the act carving the pattern a little deeper. Then there are areas where almost no tracings are found, those areas where a tracing of the result of a single performance of an act is made. This will help us to see why it is that the instincts cannot be completely inhibited, tho they may be to an extent controlled.

**Complexes.**—We saw when we discussed illusions that it often happens that a single element is common to several neuron patterns. There is a group of neurons more or less closely tied together. These group patterns will, when stimulated, produce associated movements. We have already noted that whenever an idea is in consciousness there is generated an impellent energy which seeks expression in bodily activity. This grouping of associated movements, this binding of several mental elements together is called a complex. The emotion, the impellent energy released by the idea, is one of the most powerful binders known, and yet in spite of its power it

often happens that an idea becomes entirely separated from the emotions that usually appear with it. As in illusion there is a temporary separation of the element from the correct group in which it belongs. Here there is a permanent separation of the mental element from its attendant group. These complexes account for the origin of many functional diseases.

**Mental Diseases.**—The last quarter of a century has demonstrated the physiological origin of many mental diseases. Melancholia, formerly thot to be a mental disease, is now known to be often caused by certain bacteria in the colon. Certain forms of hysteria are caused in a similar manner. These bacteria are the cause of certain emotions. Knowing the cause the psychologist tries to foresee the course and influence of the emotion. The sensible thing to do is first to see that the bacteria that are causing the abnormal functioning thru the production of certain toxins be dealt with, then if necessary deal with the mental attitude.

**Nervousness.**—Nervousness may arise from an enfeebled nervous system. It may arise from irritation caused by stimulants and narcotics, such as tea, coffee, tobacco. It may be caused by toxins within the body. Some persons are so stimulated that they respond to every irritation. They make exaggerated responses to every stimulus. They cannot overlook anything. They cannot "let go." They are "high strung." One who makes such response to stimuli is called a neurotic. One may spend so much energy in responding to these external stimuli that health is really endangered and one becomes neurasthenic.

**"Nerves."**—One may have a case of the "nerves" and have nothing the matter with his nervous system. He may be organically sound and yet suffer all kinds of torment. Disease may be caused by either a physical or a mental condition. One may have an enfeebled nervous system but a case of the

"nerves" is not due to such a cause. It is not due to physical but to mental causes. It is due to abnormal functioning of some organ or organs of the body and the abnormal functioning is due to wrong thinking. The subconsciousness is doing with the organs of the body what by some means it has been led to do. There is a vital difference between organic disease and its symptoms and functional disorders and their manifestations. The basis of functional disorders is in the mind. The manifestation may be dyspepsia, melancholia, palpitation of the heart, or a dozen other things. The cause is mental. The organs do not function properly. They have been "fussed with" as some green garage man "fussed with" the carburetor on your car. The stimulus to wrong thinking may be instinctive or it may be in a suggestion from some forgotten source, both of which may now be a part of the subconsciousness and be exerting its power from below the threshold of consciousness. There is nothing organically wrong with the body. It is out of adjustment. The suffering is as real and as painful as tho the difficulty were organic.

**Abnormal Dissociations.**—It is not unusual for the connection between a mental element and its attendant group to be so completely broken that amnesia, anesthesia, or hysteria results. The hysteric often becomes so obsessed with an idea of a certain malady, heart disease, kidney, lung trouble, etc., that he may even show clinical symptoms so definitely that competent physicians are often deceived. There are many cases of loss of memory so complete that one is left without the faintest notion of who he is or where he lives.

**Loss of Memory.**—There is the case of Ansel Bourne, a minister of Greene, Rhode Island, who disappeared on January 17, 1887, after having drawn a considerable sum of money from the bank. Foul play was suspected because of the money

he had with him when last seen. The police took an active interest in the case but no trace of him could be found.

About two weeks later a man calling himself A. L. Brown appeared in Morristown, Pa., rented a small store, stocked it with stationery, confectionery, fruit, etc., and proceeded to do business. He seemed perfectly straightforward and was not in any sense eccentric or peculiar.

On March 14, 1887, he awoke in fright and did not know where he was. He declared his name was Ansel Bourne and that he lived in Greene, R. I., that he knew nothing about Morristown, nor a man named Brown. The family with whom he lived thought him crazy, and sent for Dr. Louis R. Read, who thought the man had lost his mind. The doctor, however, sent a telegram to Providence, R. I., and Mr. Andrew Harris, Mr. Bourne's nephew, went to Morristown, identified his uncle, and took him home.

Mr. Bourne was in a weakened condition, having lost twenty pounds. He had lost complete memory of everything between January 17 and March 14. The last thing he could remember previous to waking up was of drawing money from the bank and taking a horse-car for Pawtucket, R. I.

Some three years later Dr. William James, of Harvard, who had learned of the case, induced Mr. Bourne to submit to hypnotism. Dr. James says:

"I induced Mr. Bourne to submit to hypnotism, so as to see whether in the hypnotic trance his 'Brown' memory would not come back. It did so with surprising readiness; so much so that it seemed quite impossible to make him whilst in the hypnotic state remember any of the facts of his normal life. He had heard of Ansel Bourne, but 'didn't know as he had ever met the man.' When confronted with Mrs. Bourne he said that he 'had never seen the woman before,' etc. On the other hand, he told of his peregrinations during the last fort-

night, and gave all sorts of details about the Morristown episode. The whole thing was prosaic enough and the Brown personality seems to be nothing but a rather shrunken, dejected and amnesic extract of Mr. Bourne himself—during the trance he looks old, the corners of his mouth are drawn down, his voice is slow and weak, and he sits screening his eyes and vainly trying to remember what lay before and after the two months of the Brown experience. 'I'm all hedged in,' he says, 'I can't get out at either end. I don't know what set me down in that Pawtucket horse-car and I don't know how I ever left that store or what became of it.' "

There are other cases of loss of identity that have come about thru accident that have caused a complete loss of memory and then thru some peculiar experience there is a break with the new connections and the old memory is restored and all the later happenings are forgotten. There is a case of a young man reported from Glenrock, Wyoming. In 1902 he was working in Portland, Oregon, being employed on a barge. One day he slipped and fell off the barge and struck his head upon a log and fell into the water unconscious. He was pulled out of the water and taken to the hospital, where he was delirious for several days. When he became conscious he knew nothing about the fall, nothing about working on a barge, nothing about being in Portland, Oregon, but began to talk of Glenrock, Wyoming, and of his father and family. The physicians communicated with persons in Glenrock and the young man's father went to Portland, and it was discovered that in 1898 in Glenrock the father and son were digging a ditch and had some words and the father hit the boy on the head with a shovel, but without serious injury so far as anyone could discover. Later in the day the son left his work and walked toward the village and was not seen by the family again until the father saw him in Portland in 1902.

Dr. Jallin Gilbert became interested in the case and undertook to reestablish the proper associations and tie the two parts of the young man's memory together. He hypnotized the young man who, while under hypnosis, told of his leaving home, enlisting in the Spanish-American war, deserting, tramping west to Portland, working on the barge and of the fall in which he injured his head. He could remember nothing of his life before leaving Glenrock nor of his experience after the fall. Dr. Gilbert by questioning and suggestions enabled him slowly to recall into activity neuron patterns which had become so completely dissociated from the other that finally the two parts of his life were joined in memory and a complete unity established.

**Functional Diseases.**—There are two methods at present that are applied in dealing with functional disturbances aside from the method of the regular physicians. One method aims to have the patient forget, stop thinking about his ailments, center his attention upon health instead of upon disease. The other method is to think about all the dreams, symptoms, and imaginations that occur to one and tell them all to the practitioner and do this day after day, week after week, until the practitioner has information enough to base a judgment upon and then he will tell the patient what all these dreams, symptoms, imaginations, and symbols mean, and knowing what they mean the patient will *forget* them, if he can.

**Psychotherapy.**—The one of these methods is called psychotherapy and in many cases makes use of hypnotism, or hypnosis. There are some misconceptions about hypnosis. It has been known for centuries that it is possible for one person to have such influence over another that he could induce sleep or a condition resembling sleep in the other. Mesmer, who was the first to make much use of the method, regarded it as a kind of magic and taught that there was a force transmitted

from the operator to the patient. To this force he gave the name of emanations, a term not new but new in this connection. From Mesmer came the term Mesmerism.

Dr. James M. Braid of England taught that there was not a force which passed from the operator to the patient, but that the effect was produced entirely by "suggestion." Dr. Braid used the word "hypnosis" instead of "mesmerism." We all know that ordinarily it requires force or persuasion by one person to produce action or belief in another. No one is compelled to accept suggestions, but we all do accept them every day. Our normal actions are the result of habit or of reflection and judgment. When one is hypnotized, he acts without reflection, just as he does in habit and instinct. His subconsciousness is directed by the consciousness of another.

**Misconceptions About Hypnosis.**—It has been generally supposed that in hypnosis the subject loses consciousness, but this is seldom the case. Most subjects remain fully conscious. It has been generally thot that only weakminded or weak-willed persons can be hypnotized, but children, insane, weak-minded, and hysterics are the most difficult cases. It has been thot that only a comparatively few can be hypnotized, while practically everyone can be. Some have thot that the hypnotist must be endowed with some mysterious power, but that is not so. Intelligence, determination, confidence, earnestness are assets here as they are in anything else. It is extremely doubtful that one can be hypnotized unless he gives mental assent. One cannot be hypnotized against his will.

Another mistaken notion in regard to hypnotism is that no one but the operator can arouse the subject, when the fact is that the subject may be left in the state of hypnosis and no one go near him and he will waken as normally as he does from a night's sleep. Sometimes I have had subjects who would awaken of their own accord in fifteen minutes while

others would not awaken for two hours, but I have never known of a case where the subject did not awaken normally even tho not awakened by the operator.

Of course suggestion can be given as to when a subject will awaken and he will awaken at the time indicated, just as he may be given post hypnotic suggestion, that is, while hypnotized, let him be told that at a certain time after he awakens he will do a certain thing, or when he hears a certain word he will perform a certain act, and he will do as suggested at the time suggested without knowing why he does it. He feels compelled or constrained to do the thing and does it. Usually the subject comes to associate the action with suggestion but does not have a clear remembrance of when it was given him.

We often hear it said that hypnotized persons may be directed to commit crime and do other immoral acts as a result of hypnotic suggestion, but it can be said with truth that one's moral standards cannot be upset by suggestion. If one's ideas of the rights of property is such that he cannot think with composure of stealing from another, he cannot be made to steal thru hypnotism. But if he has often thot that if he were ever hard put to it for funds, he could easily find a way to get money and cover up his trail, but has said to himself, "Of course, I never will." Such a person under the influence of hypnotic suggestion might pick a pocket, or steal from his employer, because the act is in accordance with what he has often thot he *could* do but has refrained from doing because of some restraining influence and not because of moral disgust at the idea. "As a man thinks, so is he." When the conscious restraints are removed the *real* man acts.

**Hypnotism and Sleep.**—Hypnotism is a sleeplike state induced by artificial means. In sleep attention is equally divided among all of the sense organs, and so none of the special senses functions as effectively as when one is awake. Normal

sleep occurs *thru not* concentrating the attention. Hypnotism occurs *thru* a concentration of the attention. The subject has the illusion of sleep without actually being asleep.

In sleep the muscles are relaxed, the senses are inhibited, respiration is slow, all secretions of the body except that of the skin are reduced. The temperature falls, and the sensibility of the nerves is diminished. The circulation slows up, and a depressed nervous activity results. Of course we must not forget that all stimuli are registered as well in the hypnotic state as in the normal. The difference is that in the hypnotic state they are not recognized. The subject is awake but all impulses are inhibited except those given by the operator. The process is the same as with the sleeping mother who hears nothing except the cry of her babe. Its slightest cry awakens her to full attention. We "get used" to the noises of the city and are entirely oblivious to them, yet the stimuli are registered in the neurons of the brain. As we have seen, the inhibition of impulses is an essential element in every act of attention. Hypnosis indicates an abnormal increase in the selective as well as in the inhibitory power of the mind. Hypnosis is a state of extreme mental concentration.

**Practical Uses of Psychotherapy.**—Functional disorders are caused by certain suggestions getting into the subconsciousness and remaining there. False ideas, concepts, and sense-impressions may be produced, but, so far as we know, the subconsciousness cannot produce organic change. Incidentally that does not prove that it cannot produce such change. Psychotherapy can revive memory impressions and can awaken impressions recorded in the brain which were never in consciousness, but it cannot do more than that. It cannot create new patterns. I can only recall and reenforce what has been already registered in the neurons. Any functional disease caused by the subconsciousness can be "cured" by the same

power. So far as we know its power is limited to functional diseases. There is no authentic case of an organic disease that medical science has failed to cure being cured by Christian Science, holy relics, or hypnotism. All the cures of Christian Science, Loudres, holy relics, miracle cures, are effected by natural means which the psychologist understands. The Creator has so organized the universe that much of the power which formerly men that resided outside of themselves they now discover is within them.

Our remedies in ourselves do lie  
Which we ascribe to Heaven.

HELENA in "All's Well."

The psychotherapist does not regenerate; he places one in a position to regenerate himself by using the power which the Creator has put within him. He makes one conscious of his own power. He lets one into the resources of his own sub-consciousness, helps him to reestablish normal processes of thought and action.

Thru hypnosis the operator is able, according to the susceptibility of the subject to suggestion, to block off pain, create the consciousness of pain, break up dissociations and establish associations. There is always a danger when pain is inhibited because pain is a danger signal. It is a warning that something is wrong and the first thing should be to discover the cause. Every effort should be made to determine whether the cause is organic or functional. If it is organic, the organ should be dealt with. If it is functional, the mind should be treated. In the first case the two can be treated together to good advantage. In every case it is regarded as important that the patient does not worry over the ailment. No physician wants a patient to be continually taking account of his symptoms. He does not want the patient counting his pulse or taking his temperature. The physician wants the patient to

forget those things, and thru even a mild suggestion the physician is able to aid greatly the patient. We all know that it is harmful for one to be telling continually how badly he feels. We know how repetition produces exaggeration in a story. It is the same with description of one's feelings. It is a good plan to head off one who is inclined to rehearse his aches and ills by telling him at first glance how much better he looks. It suggests health to him and that is just what he needs. It matters little what the cause of the difficulty is if it is not organic. It matters little whether it is some instinctive reaction like a sex urge, or the result of some suggestion long since forgotten. If the subconscious cause can be inhibited and a positive suggestion put in its place the patient is cured.

It is sometimes claimed that psychotherapy thru hypnotism cannot make permanent cures in all cases. That is true of all methods. There are always some who are *cured*, others who are *improved*, and others who seem to *make no gain*, no matter what method or remedy may be applied. What hypnotism does is to establish right associations and right methods of thought. Then there should follow, as in all methods of dealing with the mind, continued, new, or reeducation in order to make permanent the results obtained thru suggestion. Suggestion makes clear the possibility, and reeducation makes the possibility an actuality. Hypnotism replaces the, "I cannot" with the "I can," and makes possible a basis for improvement.

Old habits can be broken up and instincts controlled by suggestion while the subject is in the hypnotic state and often the result can be accomplished without hypnosis. Habits such as cigaret smoking, drinking alcoholic liquor, taking cocaine, etc., have been completely broken thru hypnotic suggestion. I have treated cigaret smokers and thru one treatment have completely broken up the habit so that the patient has never smoked again. It is possible for one to form the habit again

just as he formed it at first, but the "hankering" for the cigaret was gone. The same is true of scores of men who have been fighting the liquor habit. Cases of hysteria can in most cases be controlled in the same way. There is difference between the smoker and the hysteric. The smoker *knows* he is a smoker and he knows what is the matter with him and the cause of it. The hysteric does not know what is the matter and does not know the cause of it. The subconsciousness often plays tricks on the individual. I recall one young lady whose form of hysteria was that of being thrown into an illness every time her mother invited company. In time everyone in the neighborhood came to feel sorry for her. It often happened that she would be all right until about time for the company to arrive and then she would be taken suddenly ill. The company of course inquired for the "poor girl" and expressed their sympathy for her, often going up to her room and sympathizing with her, *all of which she very much enjoyed*, but she would not admit that she fell ill just to gain attention. She was entirely unconscious of the fact that she was doing so. Her mother was made acquainted with my thots about the matter and her interest enlisted. It was suggested that the next time she invited company only those who were the warm personal friends of the daughter be invited and that they be asked upon their honor not to express any sympathy for the daughter and not to go to her room to see her. If the daughter fell ill, as was expected, and as the daughter expected the mother was to tell her that she must remain in her own room and not under any circumstances be disturbed, and that none of the company should be allowed to see her because she always "got so wrought up." I suspected that when she found that her friends were not coming to her room to see her she would rapidly get better and come down to see them, and so arranged with the mother to coach them all to express surprise

at the improved looks of the daughter in case she should appear. The situation turned out as we had expected. She was taken ill, no one called at her room to see her, and about an hour later she appeared among the guests, and was apparently disappointed at the reception she received. The guests carried out their part by commenting upon how well she looked. She could not understand how she could look well and be so sick.

Later I told her that I was sure that her subconsciousness was playing tricks upon her just as the magician plays tricks upon his audience when he takes live rabbits out of a borrowed hat, or picks 50-cent pieces off the end of a man's nose. The subconsciousness plays tricks with our feelings as the magician does with our eyesight. Don't we know we are sick? Of course we do. Didn't the magician take a live rabbit out of the hat? Of course he did. We saw him do it.

The young woman was finally induced to submit to hypnosis and thru the suggestions given was completely "cured" of her illness and it has not returned. Several new interests have been developed to which thot and effort are given. She thinks of something else than being ill. Her consciousness is in control, and now she wonders how she ever got into such a state of mind as she was in formerly.

I know a physician who lives on a very restricted diet always, and has for years, when he is at home. About once a year he comes to New York for a week. While he is here he eats anything and everything that his fancy dictates and never suffers the least inconvenience. As soon as he gets home he has to return to his diet. Unless he sticks to his diet he expects to be ill and he is ill. "As a man thinks, so is he." What one expects, he is quite apt to get, especially where health enters in.

**Psychoanalysis.**—The other method referred to is called psychoanalysis and aims to correct all mental and functional disturbances thru an analysis of the dreams of the individual, or by means of what is called “free association.” Freud and Jung are the originators of the method. They make a good deal of dreams. The Freudian holds that there is a motive behind the dream that is very significant, and the real disciple of Freud holds that the motive has its basis in the sex instinct, altho some psychoanalysts no longer teach it. They hold that there is the closest relationship between our dream consciousness and our wide-awake consciousness and that anyone who is clever can by the use of symbols get at the real difficulty that disturbs the individual. Dreams do not carry their messages on their face and only in symbols, the psychoanalyst says, can the real meaning be discerned. The analysis of dreams, they say, requires an expert, that is, an expert in symbolism.

Freudians hold that dreams are the result of repressed ideas and that these repressions are always trying to get attention of the consciousness in order that the desire or wish may be realized. Cases of hysteria are taken in hand and by a process more or less tedious an analysis of interesting association of concealed facts is arrived at and these are interpreted symbolically. “Freud requests the patient to allow herself to drift aimlessly in her communication with him, and to speak of everything that comes into her mind. She is not to suppress any thot or idea on the ground that an idea happens to be shameful or painful.” The suggestion is enough to arouse the imagination of one who has an obsession, or who is neurasthenic, to exaggerate her dreams. I have heard of many cases of mental distress on the part of patients who have been subjected to unsuccessful attempts at extracting a confession about unfamiliar subjects. Suffering an indignity is an experience which is quite inseparable from the mental sex over-

hauling of practically every individual who is put thru a Freudian examination. The theory is that if these things can be dragged out into consciousness and shown up for what they are they will be forgotten and the hysteria or obsession will disappear. The patient is involuntarily led to believe that the cure will follow when a sexual "repression" has been revealed. The more revolting the incident the more necessary it is to be told and the greater his power to cure.

The dream has no special function so far as Freud or anyone else has ever demonstrated. The symbols used are the result of the most fanciful imagination, farfetched, and unscientific. Even Freudians themselves are forced to admit that the symbolism applied to one case does not necessarily throw any light on the dreams of any other individual. There is no fixed symbolism. One of the Freudian authors says that in certain cases when the practitioner cannot get the response he wants, "We are at liberty to take the dream into our own hands, and see how it can be applied to the patient's situation."

The symbolism of the Freudians is like the Allegorical method of biblical interpretation. One can get any meaning he wants, and a different one every day.

Dr. Tannenbaum, famous specialist, and former disciple of Freud, says that during his ten years of practise he found his patients were cured without the application of Freud's theories. He says, further, "Many patients have to be analyzed before one can test the truth of Freud's theories. I study my cases very carefully and keep accurate records of all they say. The study of all this material has taken years and has convinced me that Freud's theories about the unconscious and repression and the essential bestiality of man's instinctive self is false, that patients are cured more quickly and more effectively without resorting to the degrading technique of sexualizing all their dreams and all their symptoms."

And further, "To my way of thinking, an analyst should study the patient without any preconceived notions. Medical psychology should study the patient irrespective of any theories so it can create a sympathetic understanding of the patient and so help to meet his problems. The physician must study the mind and history of the patient and should not feel that he has to interpret the patient's neurosis on the basis of repression and thru the medium of symbols. Therefore, I would say that I practise psychognosis or psychotherapeutics, not psycho-analysis."

Freud's theory of repression holds that all painful matters are forgotten, that they are forced out of consciousness into the subconscious. That they are so disposed of because they are immoral, degrading, and humiliating. But we all know that we forget pleasurable things as readily or more readily than painful ones. The painful one is hardest to forget. The reason we forget is because we think things are no longer useful to us. Believing so, we dissociate them from the rest of our mental equipment.

Psychologically the method is unsound. It aims to get clearly in mind the thing that is to be forgotten, holding that when it is clearly understood it will disappear from the mind because the patient can no longer deceive himself.

The way to forget is to stop thinking of what one wishes to forget, and the way to stop is to fix the interest and attention upon something else, not to keep repeating the old.

**Dreams.**—In this connection let us consider briefly what dreams are and how they are caused. Day-dreams and night-dreams are much alike. The one who day-dreams gives himself up to reverie. When one is in meditation he knows that his mental images correspond to concepts and not to present sensory percepts. Just the opposite is true of the night-

dreamer in whose mind the majority of images take on the character of hallucination.

There is very little critical sense in reverie, but none in the dream. The attention is deprived of the initiative it has when one is awake. In the dream the attention looks on, so to speak, as a disinterested bystander. The attention cannot call upon any element. It attends only to such material as chance causes to rise in dream consciousness. It knows only what is present. Whatever is out of dream consciousness is out of existence.

The dream is a series of images tied together by association, but the dreamer does not see the ties that bind them into a series. As we know, there is an infinite multitude of neuron patterns, images, memories, below the level of consciousness. As one approaches the condition of sleep, the neuron energy which causes consciousness subsides while the subconsciousness continues active. The nerve energy is low like the current from a weak storage battery. There is not power enough to operate the starter and the lights, but there is enough to register in the galvanometer. The reduced energy runs from one pattern into another, all paths are open and there is no power to direct. Toxic poison within, cold feet without, may excite neurons sufficiently to cause dreams. If one eats welch rare-bit he will not dream the same as he will if he drinks "home brew." Day-dreams and night-dreams are of the same material. They differ in quantity but not in quality. They both depend upon brain patterns.

**Hallucination.**—If any neuron pattern in the auditory area is disturbed, one hears. If the neuron pattern in the sight area is disturbed, one sees. The patterns may be disturbed by an external stimulus coming in thru one or more of the special senses or they may be aroused by internal stimuli. If it is internal the result is an hallucination. The increased blood

pressure in certain parts of the brain due to fever or delirium causes one to see and hear many things that no one else hears. These cause a turbulent activity in the subconsciousness and if it continues insanity results. An example of the hallucination of *hearing* is seen in all probability in the case of Joan of Arc, and a case of the hallucination of *seeing* in the "Angel of Mons."

Phobias, hysterias, dreams, and many other abnormal physiological and mental functions have their basis in the subconsciousness and can be corrected thru suggestion and re-education, which means a readjustment. This comes about thru gaining a conscious self-control which will be dealt with in the next chapter,

## CHAPTER XI

### CONSCIOUS CONTROL

IDEAS possess innate impellent energy and there is a tendency for every idea to express itself in bodily activity. Often the energy is not all expended at the time of the stimulus and so there is left an after effect which may show itself in some later subconscious activity. Darwin showed that every mental state has a corresponding physical expression. If a person assumes one he is quite likely to experience the other. Anger may be induced by the closed fist, passivity may be brought about by a reclining or an incumbent position. One cannot remain angry and sit in a reclining chair. If an angry person can be induced to seat himself his anger will soon pass.

For years I kept in my office in the high school a chair with the back legs about half an inch shorter than the front ones. When a parent came in very much upset about some alleged mistreatment of her child by one of the teachers, and this would happen occasionally, I always made it a point to be very busy. I would invite her to have a chair and always gave her the one to which I have just referred and asked to be excused for a minute. The chair tipped back just a little too much to permit one to sit up straight comfortably. The parent would lean back and then sit forward, but after a trial or two would lean comfortably back in the chair and by the time I was thru with my "task" she was perfectly calm and then we could talk the case over on its merits, which could not have been done when the parent was in the attitude she was in

when she first came into the office. After this short interval she would be in a frame of mind which would enable her to act thru reflection and not thru impulse, as she would have been obliged to when she first came in.

**Forms of Control—Ionic and Atomic.**—As we look about the universe we discover what seems to be several forms or methods of control. We do not know the real cause of these controls, but we do know some of the actions and reactions. For instance, in the ionic and atomic world there is some power which controls the ions and atoms. The ions obey some power from which they cannot escape. The atom of hydrogen and the atom of oxygen are controlled by some power so that when they are brought in the immediate vicinity of each other they combine. They always react in the same manner. Whether the power is within the atom or whether it is external, whether it is a simple form of life or a purely physical force, if there can be such a thing, no one knows, but we are quite convinced that under the same conditions the ions and atoms always exhibit the same reactions which indicates a constant and permanent control. This is true of all the chemical elements. They respond to those forces as readily as iron filings respond to the influence of a magnet.

**Planets.**—When we look at the larger masses in the universe, such as planets, satellites, etc., we discover that they are moving about in regular orbits and in certain definite relations to each other. Some power either internal or external controls them. The earth, for instance, moves in its orbit about the sun and turns on its axis under such a definite control that astronomers know its exact position at any time in relation to the sun and other planets and can calculate its exact position at any past time or future date. This can be done with the other planets, comets, etc., as well. Whether this control is different from that which controls the ions that make up the

atom, or the atoms that make up the molecule we do not know, but we know something of the method and the result of the action of that power.

Jacques Loeb made some experiments to determine the effect of this same power upon the growth of some of the lower forms of life. He made a study of a hydroid, which is quite common in the Bay of Naples. He discovered that if a piece of the hydroid (*antennularia*) was cut out and hung up vertically in the water of the aquarium with the apex upward after a few days roots would appear at the lower end and the stem lengthen at the upper end. A similar piece was cut from another specimen and was hung upside down, that is with the root end above, the apex below, and to his surprise the root end formed a new stem with branches and the stem end formed roots. When similar pieces of the plant were placed horizontally or obliquely the branches from the lower side developed into roots and those from the upper side developed into stems and branches, indicating that this power determines the place of the origin of the organs of the plant.

The same thing proved to be true in a number of other forms of plants with which he experimented at Woods Hole. The power which holds the planets in their orbits and compels the roots of plants to grow downward and the branches to grow upward is what we know as gravitation.

**Plants and Animals.**—Plants and animals exercise a greater degree of freedom than we find exhibited by the planets and satellites and larger freedom than we find in the ions and atoms. In most respects plants and animals are controlled by a power and energy from which they cannot escape. We are all familiar with the power of sunlight to make plants growing in a dark room turn their leaves and stems toward the window. We may turn the plant half way around and the leaves turn again toward the light. There is no escape

from it. Many of the smaller forms of animal life are also controlled by the power of sunlight, as has been demonstrated by Jacques Loeb and others. This peculiarity of plants and animals by which they react to sunlight is called tropism or phototropism, which means that plants and animals are controlled or directed by the action of sunlight.

Aphids (plant lice) live upon rose bushes. If the rose bush is kept in a dark room with a little light entering thru the window shade, and the soil in which the bush is growing is allowed to dry out, the aphids change to winged insects, leave the rose bush and fly to the window thru which the light enters. If these aphids are put into a test tube they will approach the end which is toward the source of light. If the tube is turned end for end they will move toward the end which is then toward the light. These little insects are completely controlled by this power.

Fresh water crustaceans which are not naturally phototropic may be made so by adding a little carbonic acid to the water. Apparently some chemical action is set up in the crustaceans as a result of the water and the carbonic acid mixture which makes the animal more sensitive to the sunlight. These insects, which move toward the sun, are called heliotropic. Those which turn away from the sun, or toward the earth, are called geotropic. Certain moths lay their eggs where, when the larvae are hatched, it is possible for them to secure food near by. In the spring, as soon as the warm days come, they move up the limb of the tree to the terminal bud, where they begin to feed. After they have once eaten they cease to be heliotropic, turn, go down the body of the tree to the ground, and never ascend the limb again. Evidently there is some chemical phenomenon produced which is due to the process of nutrition. Jacques Loeb, in speaking of the Brown-tail moth, says, "These caterpillars hatch in the autumn and pass the winter in their webs.

In the spring, and often in the winter when the atmosphere is warmed, they come out, influenced by the rise in temperature. They then show a very perfect positive phototropism, and I have never found under natural conditions any animal with a more pronounced heliotropism. But, as soon as they have eaten, their positive heliotropism disappears and reappears no more even when they fast again. It is evident that the chemical changes connected with nutrition have acted, directly or indirectly, as an inhibition or a definite suppression of the photochemical reactions which the insect formerly possessed."

The power that controls the atom we call chemical affinity; that which holds the planets in their orbits and controls the direction of the growth of plants we call gravitation; that which controls plants and the lower forms of animals we call tropism.

According to Bouvier, who has made very extensive studies, there develops a dependent periodicity of reaction, actions occurring at regular times or seasons. There is also an acquired periodicity which gives rise to organic or muscular memory. He says, "Organic memory is the result of external stimuli like tropisms, and like them also is independent of the differentiation of tissues and manifests itself by automatic acts. But it is distinguished especially by the fact that it can provoke reactions (motor or otherwise) *without the aid of the stimuli which originated it*. This is its principal characteristic, one which marks the first tendency of the organism to liberate itself from the environment which surrounds it." This evidently is on the road to psychism. There gradually develops a species memory which manifests itself in all the representatives of the species. Bouvier points out also that there appears in the higher forms of insects, the articulates, a psychic power which enables them partially to escape from the power of tropism, a power which makes it possible for

them so to behave that they do not always have to respond in the same way to a stimulus. They develop to a point where "trial and error" enters in, where they are able to correct their errors by trials. "Psychism appears in the form of a choice between the diverse modalities offered in response to the variations of a stimuli."

The articulates and the mollusks have a well differentiated nervous system and brain represented by a pair of ganglia and sense organs which are connected with the brain. It is in these animals that there develops a *species memory* which looks like a form of psychism and which gives them a little wider range of reason in response to stimuli than is enjoyed by the still lower forms of animals. This vague psychism readily becomes automatic and is somewhat akin to what we call habit in the higher forms of life. The individual develops a wider range and greater flexibility than that of the species. It is possible for one of these insects to remember where its nest is, where it left its prey, and remember the way back to its nest. And along with these characteristics there appears the ability to learn. There is evidently a form of consciousness which enables the insect to improve by experience.

Fabre tells of the *Languedoc Sphex*, a kind of wasp that hunts grasshoppers, which it paralyzes by stinging and which it buries in a prepared place with one of the wasp eggs. The grasshopper furnishes food for the larva of the wasp. Fabre has studied these wasps intimately and says that they exercise memory. They change their usual mode of procedure in the face of obstacles. Turner's observations confirm Fabre's conclusions. Ferton's studies of the solitary bees of the genus *Osmia* leads to the conclusion that the memory which guides these insects belongs to the same degree of psychism as the human memory. Ability to learn is an important characteristic of the articulates. This ability differs considerably be-

tween different individuals of the same species. *The species memory* is supplemented by an *individual memory* which makes for a wider variety of action.

Certain sensations of these insects may be so intense that for the time being they destroy all others, just as is true of man who becomes "entirely absorbed." Many of these impressions readily become automatic or habitual, but these habits may be changed. Associative memory, as referred to by Loeb and Bohn, as well as the conclusions of Bethé, indicates that wasps, cockroaches, crawfish, and crabs are capable of modifying their habits and of learning to form new ones.

In speaking along this line Fabre says, "Pure instinct, if it existed alone, would leave the insect unarmed in the perpetual conflict of circumstances. . . . A guide is necessary. . . . This guide the insect possesses to a very evident degree. It is the second domain of its psychology. In this domain it is conscious and can improve by experience. Not daring to call this aptitude rudimentary intelligence, which is too advanced a title, I will call it *discernment*." Considering observations of Fabre, along with observations of George and Elizabeth Peckham, we note that the acts of the insects which they studied, in which the insects used a very small pebble as a tool for pounding the earth into place over its nest until the ground was made level, is no longer an instinct. It is a reasoning act in which means are adapted to ends.

**Mammals.**—When we consider mammals we find a greater degree of freedom. They are not as completely controlled by gravitation as rocks. A cat can adjust itself even while falling, but a rock cannot. Mammals are able to adjust themselves to conditions, to choose, to learn by experience, and to determine lines of action in a way that we do not find in the lower forms of life; however, in certain fields the control is quite fixed. The chemistry of digestion and the physics of assimilation are

probably the same as similar reactions anywhere. All animal life is very definitely controlled by temperature. There are instances where certain animals live in valleys which are surrounded by mountains and where the temperature of the mountain passes which lead out of the valley is so low that the animals never go out of the valley. The temperature forms a permanent barrier against migration.

**Man.**—Human beings are able to enjoy a much wider freedom from control than any of the other mammals. Man can adjust himself to gravitation and to temperature in a way that none of the other animals is able to do. Man has been able to adjust himself to almost all temperatures of the earth's surface, ranging from the extremely hot climate of the sea level regions of the torrid zone to the arctics. Some of the mammals have, under the influence of man, been able to adjust themselves also and so free themselves to a degree from the control of the natural forces, altho there has been substituted for them the control of man. The dog is man's companion in practically all climates.

Man has been able to free himself to a degree from these external controls by virtue of the fact that he understands somewhat of the relation of cause and effect. He can picture to himself what will happen as a result of certain causes and by virtue of the "idea" which he holds in consciousness he is able to exercise a control over himself and over the forces of his environment.

We are on safe ground in saying that as *chemical affinity* controls the atom, *gravitation* the planets, *tropism* the plants and lower forms of animals, the *idea* controls the actions of man.

We noted at the beginning of this chapter that ideas possess a certain amount of energy, and if the biological chemist is correct the idea in consciousness creates a chemical reaction in

the body as definite and as sure as that caused by external stimuli. Recently I heard a noted psychologist say in a lecture that he could select ten persons from the group and tell them that after they had left the room he would send to them another person who would ask a question of one of the ten but that the speaker would not know which one of the ten would be asked. After the question had been asked the group would return to the room. The psychologist said he could then tell which one of the ten had been asked the question. This he explained he could determine by the amount of sugar in the blood. The reason for it is that everyone of the ten had a certain idea in consciousness as the result of the selection and with the idea a certain emotion was aroused. This emotion sets up a chemical reaction in the body which results in increasing the amount of blood sugar. The greatest emotion, however, was aroused in the mind of the one who was chosen to be asked the question and the result was a greater increase in the amount of sugar in his blood.

**Conscious Control.**—If the scientists are right we see that a man is controlled in general by his ideas, and as we have all seen within a very wide range the normal person can control his ideas. That is, he can determine what ideas shall remain in consciousness.

We all of us know from our own experiences that the thing that we have seriously thought of doing we are quite apt to sometime later try to do. The normal person has the ability to inhibit ideas which he does not want in consciousness and by inhibiting them prevent them finding expression in action, particularly so if he replaces them with other ideas which result in action along a different line. The only way to secure right conduct is first of all to secure right thinking, and right thinking can only be produced by inhibiting those elements which have no place in right ideas. What we are

to be and to do tomorrow is determined by the ideas that we let possess our minds today.

What will be our status in the future? How far have we thought ahead? Do we know, for instance, that statistics prove that out of every one hundred average men and women, thirty-six die of preventable diseases before they are sixty-five years of age, that of the sixty-four who live longer, one will be rich, four will be well-to-do, five will be earning their own living, and fifty-four will be dependent upon relatives, friends, or charity? And do we realize that these fifty-four are the ones who were never able to exercise anything like a complete self-control? They were always directed or controlled by some influence outside of themselves.

There is need for everyone to understand his past experiences and his present relationships well enough to forecast his future program so that he may not float with the current, but if necessary pull against the stream in order to attain the goal he has set for himself. Suppose you were asked to think about what you expect to be ten years from now, to see the entire picture, position, income, family, friends, and then think of what seems to be the greatest obstacle in the way of attainment and then explain how you propose to overcome it. Would you have a definiteness about your plans for the future which would indicate success? There should be a singleness of aim. It should be definite and along with it a determination to secure its attainment. That calls for insight and perseverance.

In this connection it is well again to raise the question of self-mastery which we have raised in an earlier chapter. Self-mastery means doing what you want to do when you want to do it. Do you do what you intend to do? Do you have the power to hold yourself to the task until it is completed? Have you allowed yourself to become a slave of habit or are you able to set aside any habit you have formed and adjust yourself

readily to new conditions in spite of habit? If you are able to do this you are in a position to exercise self-control and self-mastery. Do other people realize that you are master of yourself? Is your word as good as your bond? Have you fixed a goal or a route to be followed and set it definitely enough so you can say, "This one thing I do;" whether it is the acquiring of knowledge, the gaining of power, or the acquiring of riches?

Character is regarded as the most vital element in human personality and this has a close relationship to self-control. There is a wide difference between character and reputation. Reputation is one's general standing in the community, while character is what one really is. In general, conduct is the expression of character. Conduct is determined by one's ideas. Therefore, if one's actions are not satisfactory it is because his character is not sound and back of his character are the ideas. If you wish to change the conduct of another you must do it in one of two ways—either by fear, which will compel him to act as you wish, or by putting into his mind different ideas. If you can help an individual to arrive at new ideas you can thereby influence his character and thereby his conduct. If workmen everywhere had a right idea of property rights and if corporation interests everywhere had a right idea of human rights, there would be less conflict in the field of industry.

Every normal person knows that his ability to do depends very largely upon what he *thinks* he can do. If one feels that he cannot exercise control over himself well enough to hold himself to his task, he will not win. Someone has written what has been called "The Booster Spirit," which runs as follows:

If you think you are beaten, you are;  
If you think you dare not, you don't.  
If you'd like to win, but you think you can't,  
It's almost a cinch you won't.

If you think you'll lose, you're lost,  
For out of the world we find  
Success begins with a fellow's will—  
It's all in the state of mind.  
If you think you're outclassed, you are.  
You've got to think high to rise.  
You've got to be sure of yourself before  
You can ever win a prize.  
Life's battles don't always go  
To the stronger or faster man;  
But soon or late the man who wins  
Is the one who thinks he can.

**Health.**—No matter how keen one's mind may be unless his body is in good condition he cannot get from it the service he ought to get. Health depends upon the growth and repair of the body and these processes are dependent upon the blood supply. The blood supply and its condition depend upon food, air, drink, and exercise. One should sleep with open windows because when one is asleep only a small fraction of the amount of air can enter the lungs as does when one is awake. One should drink two quarts of water daily in order that all the waste matter of the body may be removed. One should give considerable consideration to the quality, and the amount of food. We need nitrogen, carbohydrates, and fats in the proper proportion in order to keep the body in repair. We need dairy products and green vegetables because they contain the largest percentage of vitamins, without which persons develop scurvy, rickets, and bad teeth. At the present time there is being sold what is known as "filled," or "oiled" milk. That is, there is removed from the milk the butter fat and there is substituted for it cocoanut oil. The difference between vegetable oil and animal oil is that the vegetable oil contains none of the life-giving, life-preserving factors known as vitamins. We need some coarse foods, such as cabbage, cauliflower, turnips, carrots, parsnips, etc. They contain a little starch and sugar, some vitamins and mineral salts of different kinds. Fish is a watery, rather indigestible protein of inferior quality. The richer

kinds like salmon, eels, halibut, mackerel, have some food values because of the fats. Most of us have too large a percentage of starch in our diet. We eat bread, rice, corn, potatoes, and not enough milk, butter, meat, bacon, fruit, and green vegetables. Because of this we are anemic, instead of red blooded, as we should be. Those who live largely on starches are weak, lazy, and pessimistic.

Dr. McCullom, of Johns Hopkins University, has conducted over 4,000 feeding experiments on animals, and he found that of animals fed exactly alike except that one was given "filled" milk and the other whole milk, the one fed on "filled" milk died in a very short time while the other grew and thrived on whole milk. Dr. McCullom says, "I guarantee that any infant fed on this milk substitute will develop rickets in a very few weeks." Many states have laws prohibiting the manufacture and sale of "filled" milk.

The experience of the world war has given us a new conception of the value of a proper diet. The troops that ate the least bread and the most meats, those from New Zealand, Australia, Canada, and the United States, made the finest shock troops in the war. When Germany began to run out of meat, animal fats, milk, and cheese for her troops her doom was sealed. She had enough of bread, starch, and vegetable oils right up to the Armistice. People of Germany and Austria are today, four years after the war, pale, flabby, and bloated and their children are dropsical and rickety and dying of tuberculosis at three times the rate before the war. They are dying for the want of meat, bacon, butter, and milk. Dr. Woods Hutchinson says, "All the silly old prejudice against meat, that it heated the blood (whatever that means) and produced uric acid to excess, hardened the arteries, inflamed the kidneys, caused rheumatism, etc., has now been proved to be pure fairy tales, utterly without foundation in scientific fact.

"Red meats have nothing whatever to do with causing gout and rheumatism because neither of these diseases is due to foods or drinks of any sort but solely to what we call local infections. Little pockets of pus (matter) full of robber germs—mostly streptococci—around the roots of our teeth, in the pouches of our tonsils, in the nasal passages and sinuses of our foreheads and faces opening into them; . . . Our belief now is: 'No pockets of pus, no rheumatism or gout.' Food of any kind has absolutely nothing to do with the case.

"On the other hand, the very worst cases on record in all medical history of hardening and turning to lime (calcification) of the arteries all over the body, and in the kidneys and intestines particularly, have been found in Trappist and certain orders of oriental monks who live almost exclusively upon starch and pulse—that is, peas, beans, and lentils and abstain from meat entirely."

These statements from Dr. Hutchinson are of importance, to us in view of the fact that so much attention is now being given to blood pressure. The hardening of the arteries is somewhat similar to what would happen to a rubber tube if it is distended beyond its normal size and held there for considerable time. It loses its elasticity and resiliency, but if the pressure can be relieved at intervals the tube will last much longer. Physical exercise should result in such a change of action as will bring a change in the circulation of the blood and in this way increase the circulation, and then when the exercise is over it will decrease.

One ought to take such care of himself as will enable him to know the general condition of his health at all times. It is very much easier to keep well than it is to get well. The great service physicians will render in the future will be along the line of caring for healthy persons and helping them to remain healthy rather than in trying to cure sick ones. The American

Health Extension Institute is doing a splendid piece of service in teaching men and women the need of an annual physical examination. It is worth more than it costs to have a report from an expert physician that one is in fine physical condition, and it is worth more than it costs to discover that there is a tendency toward a weakness in some particular organ or an improper functioning of an organ which may be corrected. If one keeps himself in fine physical condition thru proper food, drink, rest, and recreation, he will have gone a long way toward being able to do what he wants to do.

**Scientific Concepts.**—Man has slowly been getting away from the “trial and error,” “cut and try” methods thru his desire to achieve. His experiences and investigations have disclosed uniformities and laws, the complying with which has made it possible to attain ends much more readily and much more economically than was possible under the earlier crude, haphazard methods. Man has classified these laws as physical, biological, sociological, psychological, etc. He has sought knowledge in order that he might do more with the materials which he finds at hand.

Science is classified knowledge, whether it deals with history, mathematics, biology, sociology, or any other facts of experience. Actual experience furnishes a knowledge of the facts. It is not the fact itself but the use of fact that determines its value. It is not things alone but classes of things in which we are interested. In all fields of action we must depend upon actual experience for our material. Science deals only with facts of human experience. These facts are submitted to classification and generalization.

**Generalizations.**—Science is never expressed in terms of actual things but in general terms about things. Generalizations make no reference to physical realities that can be known thru the senses. They are always expressed in abstract terms

like ion, electron, point, line, particle, ether. They always express class characteristics of material things rather than the things themselves.

**Use of Generalizations.**—We apply generalization to facts of experience in order that we may predict future events. Each person employs the elements of his own field. The farmer thinks of red clover from the standpoint of his interest as a farmer; the botanist from his point of view as a botanist; the physicist from his point of view as a physicist. That is, the farmer thinks of the red clover in terms of food for his stock; the botanist thinks of it in terms of family and function; the physicist thinks of it in terms of motion and of structure. The psychologist deals with the world of experience in terms of impulses, emotions, and ideas, so he deals not so much with the red clover as with the farmer, the botanist, the physicist, and if conscious control is to be developed there must be an understanding on the part of the farmer, the botanist, the physicist, and the psychologist of the place that ideas occupy.

**Search for Unity.**—In the last two thousand years or more there has been a search for a unity to which all things might be related. During the last century three great hypotheses have been set up and their establishment has gone far toward helping us reach that idea of unity. One of these is the doctrine of the conservation of energy. The experiments of Dr. Mayer of Hamburg, Germany, and of Dr. Joule of Manchester, England, opened the way for a general understanding of the field of energy. The studies of the physicist and the chemist in regard to heat, light, sound, electricity, and of wave forms in general, have resulted in the establishment of a relationship between physics and chemistry which was not previously known. Physics and chemistry are so related now, in fact all the physical sciences are so closely related, that when

we learn about any one of them we are learning about all. Froebel's criticism of the education of his day was that subjects were taught as subjects, that there was no unity developed. One's knowledge of mathematics was in a sort of watertight compartment. His knowledge of physics in another, etc. There was no approach to the whole field of knowledge which enabled one to see that knowledge acquired in one field might throw light upon the knowledge in another.

**The Cell Theory of Life.**—The experiments of Dr. Schwann of Germany and Professor Huxley of England resulted in establishing the cell theory of life which means that all life begins with the single cell; that from the simplest form of life to that of the highest, every individual begins with a single cell. Before their day man studied botany and became acquainted with the fern, the rose, the grasses, studied them in regard to function and structure but studied them primarily as plants. He studied zoology and learned about the oyster, the rabbit, the horse, and became able to trace the life history of each, but when the cell theory of life became established one realized that when he studied the life of a cell in plants he was acquiring light which lighted his way thru the entire field of plant and animal life and a unity began to appear in the field of biology which had not previously been known. The same thing was true in regard to geology and astronomy because by the aid of the telescope, the spectroscope, and the microscope man became conscious of the fact that in composition and structure the earth is a part of the great universe, and then when one becomes familiar with the elements which compose the earth he is thereby increasing his acquaintance with the entire universe.

**Natural Selection of Species.**—The studies of Darwin and Wallace threw a great flood of light upon the origin and development of species. While the views of these men have

been somewhat modified by the work of men like DeVries, Mendel, and others, scientific men of today see a unity in the entire range of life from its simplest to its most complex form. The psychologist sees in the psychical development a similar unity. So much so has this unity made itself apparent today that we speak of the physical, the biological, and the psychical, and men are now searching for that unity which is beneath, thru, and above all.

**Unity in Mind.**—The idea of the early psychologist was to the effect that the mind of man was tripartite—feelings, intellect, and will, and these were studied as particular faculties. Man was regarded as a sort of a trinity in unity. A further study in psychology has made it evident that man is a unity, that his mental life is not divided into parts but that his whole being is active in every psychosis, that he cannot exercise his will without intellect and feeling, that he cannot feel without the exercise of his intellect and will. So if we are to approach the subject of conscious control intelligently we must approach it in the light of the knowledge which the leaders of thought today have, and we must become familiar with the fact that it is the idea in the mind of man, rather than his impulses, his instincts, or his habits that controls his actions.

**Constitution of the Mind.**—We have noted in a previous chapter that the mind is much more than consciousness. It is built something like a stone wall. Thoughts are the result of assorted sense impressions taken from the field of experience. These little assorted elements are like small stones which with mortar make the solid wall.

The mind has sometimes been likened to an iceberg, but the analogy is not accurate except for the fact that as the iceberg is ice clear to the bottom, so consciousness and subconsciousness are mind clear thru.

We have noted that the subconsciousness controls all bodily

functions and all vital operations, that the seat of all functional disease is in the subconsciousness, that the subconsciousness conserves the experiences subject to the call of interest and attention. In the last chapter we saw some of the methods employed to correct these functional disorders.

**Conscious Controls Subconscious.**—Each one may determine for himself what ideas shall be called from subconsciousness. He may select each idea and so control his emotions. He selects the material out of which his judgments are formed. This being the case it is a question of the selection of the right elements, whether it has to do with health, wealth, or happiness. The ideas in mind are there because the person has consciously or unconsciously made the selection.

**How Consciousness Controls Subconsciousness.**—Let us refer again to the energy of the living cell and remind ourselves that the mind deals with the bodily organs as tho they were a part of an external, organic world. It uses the body as a machine. The subconsciousness has no contact with the external world except thru the stimuli which affects one's nervous system. Many of these stimuli do not arouse consciousness but are recorded just the same. Even in hypnosis the contact of the consciousness with the external world is thru the consciousness of the hypnotist and the stimuli which he furnishes. The cerebrospinal system is the organ of consciousness and the sympathetic system is the organ of subconsciousness so far as it relates to the vital organs of the body. The attention is selective, the agent of consciousness. Whatever one attends to has a larger place in his consciousness than what he does not attend to. The greater the concentration of one's attention upon any one idea the greater power it has over the subconscious control of the bodily functions.

**Conscious vs. Natural Selection.**—As one expands mentally he gains in conscious control. An *enlarging conscious-*

*ness* means that one is becoming better acquainted in all lines of mental activity. The one who knows physics as a science has a larger consciousness than he who does not. That is, the one whose range of knowledge is widest has the largest consciousness. His consciousness enlarges as he expands mentally. The subconsciousness is in control in all the animal world. The subconsciousness can be educated below the plane of consciousness as we saw in connection with habits.

There was a time in the early history of the race when the inhibition of subconscious powers resulted in danger of death to the individual. Reason was too inefficient then to be always a safe guide. It was not safe when one heard a strange sound to wait to investigate. The only safe thing to do was to obey the impulse to flee, but now man has reached a position where he can take time to think.

**Conscious Control Just Appearing in the Race.**—Conscious control is really a new experience in man. The race has followed impulses so long that to bring about conscious control is like the development of a new faculty or quality of the mind. It is rather unstable. The greatest obstacle to conscious control is rigidity of mind and the only way to develop conscious control is to bring about a plasticity of mind. A change of point of view is the only way to bring this about. The subconscious is always an obstacle to adaptability. It is like habit in general. It saves time but it hinders adaptation. Among civilized people the road to a larger life has led from physical to the mental control, from the subconscious to conscious control; that is, from control by impulses to control by reason.

**Limiting the Subconscious.**—As man has developed his instinctive actions have become more and more limited. His enlarging consciousness or mental evolution leads him to seek continually for a cause for every action, and he not only seeks a cause for every action but seeks to acquaint himself with the

results of the action. He must secure a conscious control over every muscular reaction if he is to make reflection his master. He must have a clear conception of any muscular movement to be performed. He must inhibit the erroneous preconceived ideas which subconsciousness suggests is the manner of the performance. He must be able to issue new conscious mental commands which will set in mind the right muscular movements. To most of us the end is the thing sought, but if conscious control is to be secured one must give attention to the "means whereby" as well as to the "end." If one is learning to play tennis, golf, or billiards, he must acquaint himself with the muscular reactions and make them habitual before he gives his attention to the purpose or to the result of these reactions. The same thing is true in regard to the teaching of penmanship. Most of us, if we can recall when we were taught to write, remember that we were more concerned about the thing that we were writing than we were about the way we held the pen, and yet it was quite essential that the muscular reactions be mastered and made habitual in order that right habits might be formed. I suppose nine-tenths of us today have so little conscious control of the muscles of our body that we are unable to do what we want to do. If we were asked, while standing, to throw our shoulders back every one of us would throw the head back. It is a common experience in the gymnasium for the physical director to find that when he wants to develop muscles of the shoulders and chest and instructs the man who is to take the exercise not to bend at the hips but to exercise the arms that he may develop the muscles of the shoulder, to find that after one or two movements of the arm the body begins to bend at the hips. The men are not conscious of the muscular reaction. They are thinking about lifting the pulley weight off the floor rather than of the "means whereby" muscles are developed.

**Control Without Hypnotic Trance.**—We have noted that complete control can be exercised thru the hypnotic trance, but it has always seemed to me that one ought not to resort to psychotherapy, psychoanalysis, or to hypnotism until he is thoroughly satisfied that he cannot secure complete control without it. When one understands the peculiarities of the subconsciousness and realizes that the impressions registered there have been registered as a result of stimuli of which he may have been conscious or unconscious and realizes that his consciousness can control his subconsciousness, he is in a fair way to bring about a proper functioning of every organ of his body unless the organ is in some way impaired.

I have had many persons come to me wanting to be hypnotized for some functional disturbances or for the correction of some habit like the cigaret or the liquor habit, and have advised them strongly to correct the situation themselves and have in scores of cases advised them from time to time as to how they can get control of themselves and have seen them secure full mastery. This, to my mind, is far better than it is to have one feel that he must make a crutch of another which is, in reality, what he does when he goes to a physician or a psychologist for treatment of functional disorders. On the other hand, I have known cases where it seemed quite impossible for the person to exercise enough conscious control to bring about the proper functioning of the vital organs, or to upset a habit. The principal reason for this is that the subconsciousness seems to have lost all confidence in the conscious suggestions made by the person. It is a good deal like the new year's resolutions which one makes. On New Year's Day one decides that he will quit smoking, and in all too many cases after a few days he thinks he will smoke just once to see how it tastes, and after a few days more he smokes again and then is soon back a slave to his old habit. As a result of repeated performances of this

kind the subconsciousness has rather lost faith in the conscious suggestion. The subconsciousness does not believe what the consciousness says. Often in such a case a suggestion in the hypnotic trance made by another releases a power and an energy in the subject which he himself was unable to release, but this situation is rare, much more so than we often think.

**Auto Suggestion.**—Psychologists have discovered that the best time for one to make suggestions to himself, that is to apply auto suggestion, is just before going to sleep when all of the senses are rather quiet and the attention is lax. They have also discovered that one's own subconsciousness is in reality as amenable to suggestion thru his own consciousness as it is to suggestion from another. The prerequisite is an earnest, intelligent application of the suggestion given. Auto suggestion is in accord with well known mental laws. Someone has said that education is three-fourths encouragement and the encouragement is the suggestion *that the thing can be done*. If one has clearly in mind the habit to be broken and desires earnestly to break it and just before dropping off to sleep will think clearly of the reasons why he wants to break it, the harm it is doing, the inconvenience it is causing and the satisfaction that will come when he is rid of it and emphasizes to himself the fact that he can and will break it, he is on the right road to make the correction and the readjustment.

Thru the subconsciousness one can revive memory impressions but memory impressions are dependent upon the actual brain impressions and upon the association fibers which connect these impressions, hence the subconscious can only recall and reinforce what has already been registered in the neurons of the brain; it cannot create power.

**The Abnormal.**—There is a deviation from the normal in all of our experiences. We begin life as imitators and thru the effort expended in trying to imitate we come to originality.

Just how far one may deviate from the normal and not be regarded as abnormal is difficult to say. In fact to know exactly what the normal is is difficult because it is an arbitrary point. But the abnormal is not the result of a different set of laws and does not have different avenues for its expressions or different sources for its impulses than the normal, but it does have a disproportionate share of the mental power and expresses a tendency to extreme or irregular functioning. If one is familiar enough with himself to understand his own peculiarities, he will know when he is beginning to exaggerate in various lines of reaction and can then check himself up. If he finds that he is inclined to procrastination, then he ought to face that and recognize the fact that he is inclined to delay, to put mental spurs to himself and move more quickly. If he finds that there is a tendency for him to act hastily without securing all the facts, again he must apply conscious reasoned control and make himself wait until he has secured all the facts that have a bearing on the matter in hand.

**The Psychological Moment.**—There comes a time in every situation when one feels that he has all the facts, that he understands the necessary relations, he sees the problem, his idea is clear, his emotions are aroused, and the impellent energy is ready to be released. That is the psychological moment. If action is then deferred hope and ambition drop and one feels that it is too late. I suppose it was such a thing as that that Shakespeare had in mind when he said,

There is a tide in the affairs of men  
Which taken at the flood leads on to fortune;  
Omitted, all the voyage of their lives  
Is bound in shallows and in miseries.

JULIUS CÆSAR, Act 4, Scene 3.

**Variation in Control.**—There is almost as wide variation in control among men as there is among the lower animals. One's control depends largely upon the degree of intelligence

he possesses. A child, an imbecile, a moron, a normal person all exhibit different degrees of self-control. Ordinarily the more intelligent one is the more control he has over his body. Somehow a coordination between mind and muscles is brought about which does not seem to be possible at lower levels. To secure conscious control so that one may always exhibit a splendid repose, never get rattled, always be sure of himself, he must acquire a knowledge of himself and of his environment which can be secured only thru effort. Alexander gives the following suggestion as a means toward securing conscious control: 1—A clear conception of the movement required. 2—Inhibit all wrong ideas which subconsciousness suggests. 3—Issue new and conscious mental orders which will set the proper muscular mechanism in action. 4—The movement of the muscles which carry out the mental orders. 5—Make this a principle of life.

**Loss of Control.**—It not infrequently happens that men who have gained conscious control allow themselves to develop habits which tend to break up that control. This may be illustrated in the case of Cyril Walker, the Englewood professional golfer, as reported by Grantland Rice. Walker formerly played at a speed somewhat faster than the average player. Then in Walker's own words, "I began to take a little more care with my game. I began first by picking up any stray sticks or leaves around the ball from the fairway, then I began taking another waggle or so in addressing the ball to be sure that I was all set in the right way. Finally the habit began to grow on me. This last winter I got so I was trying to find imaginary objects around the ball. It might be lying perfectly but thru force of habit I would stoop over to look for something to pick up, the smallest sort of objects that could never affect my swing. In the same way I began to use more and more time addressing the ball until there were days when I

could not seem to hit the ball until I had addressed the ball ten or twelve times.

"I had undoubtedly hypnotized myself. I wanted to play faster but I couldn't. I had worked myself into a habit that I could not stop in the middle of a tournament season, but that is now all over. From this time on I am going to be one of the fastest golfers in the game in place of being one of the slowest. I am not going to play in another tournament until I am sure I have broken the old spell, until I am sure I can step up and hit the ball."

This is due, says Mr. Rice, to the fact that the mental side of golf is even more important than the physical. By mental side he explains, "We do not mean the possession of brains. We mean rather the matter of mental control, where it is really possible that a thin mentality may work better than a broader one. No physical strength is required for a chip shot or a three foot putt, yet only think of the number who muddle up these efforts by suddenly lifting the head on the down stroke.

"Once the head-lifting habit is developed, it can tear the soul out of any round. It is not so much that one gets physically stale as it is that one gets mentally stale. This means the complete loss of mental control and the ruination of one's play."

It tends not only to ruin one's play but it is exhausting in the extreme. Mr. Walker reported later that he was doing surprisingly well on his test of faster playing but furthermore he says, "Before I was almost completely exhausted after eighteen holes. Now I am getting some fun out of the game and I am sure I will be able to play much steadier golf. I can see now why it is that George Duncan and Abe Mitchell can look so fresh after thirty-six holes, day after day. They merely step up and hit the ball."

We find a splendid example of mental and physical self-

control in Charles Albert Bender, one of the fastest Indian athletes the country knows. A Chippewa, born at Brainard, Minnesota, in 1883, later the pitching hero of the world series with the Philadelphia Athletics. Bender joined the Athletics in the spring of 1913, after playing a short time on the baseball teams of Carlyle Indian School and Dickinson College. He set his best mark of victories by leading the American League pitchers with a record of twenty-three games won and five lost. He has been a potent factor in winning three pennants and two world series for the Athletics, and he has always shown his best work in these crucial games.

Bender is also one of the most proficient trap shots in the country and is just as good a field shot as he is a trap, both with shotgun and rifle. He is an expert billiard player, an excellent swimmer, and has achieved prominence in any sport that he ever tackled.

Aside from his physical ability he has a coolness under fire that amounts almost to carelessness, a quiet, unerring eye, a cool, calm judgment under the most trying conditions, and apparently an absolute lack of nervous system and a control that refuses to be shaken in the most crucial situation. More than once in a crucial series on which everything depended on the result of one game, no pitcher known to baseball has proven more effective as a batter than Bender. He seems to be able to do what he wants to do when he wants to do it.

I think we may rest assured that one can learn to do and to be practically what he desires to be. It is a question of mastering the details, paying the price. When this is done the reward is sure.

## CHAPTER XII

### TEMPERAMENTS, VOCATIONAL GUIDANCE, AND SUCCESS

IT is common knowledge that we judge people by appearances, which means that we judge them according to physique. We do not expect to find the man of large physique as quick and responsive as the one who is of finer, smaller frame. Judging by appearances is an old custom. The phrenologists thought they found an explanation for the various mental reactions in the shape of the head and the physiognomists in the appearance of the face. There is just enough truth in the matter of the relation of physique to character to deceive many people and yet there is a close enough relationship to warrant our giving some thought to it.

Temperament has to do with the original nature of the individual, and it comes to expression in the sensibilities and emotions, for these are the avenues thru which psychic expressions are manifested. Temperament does underlie and set limits to development and character. We may get a clue to one's temperament, not only by observing his physique but by discovering the incentives that lead to action and by a consideration of the vigor and quality of the action.

There is in all men the sensitive or the receptive factor. One person is very much more sensitive to stimulus than another. He is more receptive. One person is more active than another, expression is a more important factor than in another. We may note this as we think over our contacts with men. When a criticism is made of the actions of several per-

sons, one takes the criticism calmly and quietly while another one storms, gets angry, and gives violent expression to his feelings.

**Achievement and Endowment.**—It was thot formerly that one could understand the natural endowments of men by knowing their achievements, but accomplishment is an uncertain clue to ability and to natural endowment. One cannot always discover a person's ability by knowing what he has done. No one knows just what he himself can do. All he does know is what he has done, and one's best may not yet have been called into activity.

Temperaments have usually been classified under four heads, which are usually given as follows: Sanguine; melancholic; choleric; phlegmatic. Each temperament has certain general outstanding characteristics.

**The Sanguine.**—The sanguine temperament is usually indicated by a moderate plumpness of the parts of the body, rather firm muscles, light hair, strong pulse, good circulation, and may be called "red blooded." It corresponds quite closely to what Jastrow calls the *sensitive* ACTIVE, which indicates that a slight incentive leads to prominent action. The mental characteristics of the sanguine temperament indicate that there is little time spent in reflection or in weighing conditions. There is small emphasis upon feeling and a good deal upon action. The sanguine temperament is not over-accurate or over-intelligent. There are not many great men of this type. There is a lack of sound judgment. They are not very constructive. They flare up like a pine fire which is very hot but does not last long. They are cheerful, ardent, hopeful, and confident. They are said to be the ready, practical, executive type.

**The Melancholic.**—The melancholic temperament is indicated by medium stature, rather bony and muscular, rather

dark skin, eyes, and hair. This temperament was formerly referred to as "black biled." It requires a good deal of incentive to secure action.

The mental characteristics indicate that one of this class is apprehensive, that is, looking forward for things to happen, is pensive, calm, light spirited, a bit superstitious, sentimental, somewhat subjective, is slow to anger. He is like the anthracite fire. It requires considerable time to kindle, but it is hot and lasts long when it gets to burning. A melancholic temperament indicates a person of intense feeling. He is deliberative, has great development of intellect, often swayed by fear of consequences, apt to be a trifle hesitant, and loves action.

**The Choleric.**—The physical characteristics of the choleric temperament are the broad shoulders and the narrow waist, bone and muscle predominating. Persons of this type are usually found to be aggressive, courageous, energetic, but do not have sustained responsiveness. They are impulsive. Any obstacle arouses violent opposition. They are quick tempered, fiery, irascible, impatient, swayed by anger, and lack persistence.

**The Phlegmatic.**—The phlegmatic temperament is sometimes referred to as the "lymphatic." The physical characteristics of this temperament are indicated in the fulness of the body, a tendency to corpulency. The hands and feet are large, the features are full and heavy, the flesh is soft and flabby. Persons of this temperament are calm, cool, pleasant, good natured, stoical, serene, easy-going. They have good common sense, good judgment, not much originality, not much imagination. They have good self-control, are good-natured, placid, and sympathetic. They are even-tempered, "angerless." There is indicated a feeble susceptibility to impression and a weak expression. They go along in the even tenor of their way.

**Variations.**—There are all degrees of variations between any two of these classes and the characteristics indicated may

be considerably mixed in one person, so much so that it is next to impossible, if not completely impossible, to know the character of an individual by his appearance.

**Character by Observation.**—Conduct, which is the expression of character, is action produced by impulse, incentive, and motive. It may be due to inertia of the nervous mechanism or it may be due to sensibility, to stimulus, or it may be due to the opposite and no one can tell by observation. Observation may possibly indicate the characteristics of an individual, but it cannot indicate character because it does not take into consideration the education and the experience of the individual. The phrenologists and physiognomists attempt to read character and to determine vocational capabilities of men and women by the observational method, but so far as I know no one who practises reading of character sticks to observation alone. Phrenology and physiognomy are pseudo-sciences and bear about the same relation to psychology that alchemy bears to chemistry. Of course phrenology and physiognomy are both in ill repute among scientific men today and so the terms are almost never used, even by those who practise the art of character analysis by observation.

**Shape of Head and Face.**—We made reference in an earlier chapter to the fact that one's ability and capability cannot be determined by the size of his head. Neither can it be determined by the shape of his face. Of course within wide limits one can judge fairly well. The man of ordinary intelligence can tell an imbecile from a man of unusual intellectual ability often by looking at them. He certainly can if he has opportunity to observe them for a time. But where the person who undertakes character reading by observation fails is when he undertakes to determine how much a candidate knows. He cannot tell whether one knows the multiplication table or whether he knows all the mathematics of the expert engineer,

He cannot tell by observation whether the man knows one language or ten. He cannot tell by observation whether one is a thief or a murderer. He would not be allowed by any business concern to select an employee for an important executive position simply upon what he could observe of the individual who is applying. At best, in spite of all that is said to the contrary, the most that can be done is to note a few characteristics, but characteristics are not character. One may have the characteristics of a miser and yet have been under an influence from early childhood which has developed a spirit of benevolence. One may have the physical characteristics of pugnacity and yet under years of training have brought the spirit of pugnacity under control and have developed a fairly agreeable personality.

A few months ago in New York City a prominent psychologist sat in the audience while one of these vocational analysts by *observational methods* was reading the character of a number of persons who were called from the audience. Later in the evening an opportunity was given for questions. This psychologist, who was unknown to the "vocational analyst" asked if the vocational analyst would stake his reputation on the result of an attempt to select the imbeciles and the normal minded boys and girls of high school age if the said psychologist would bring a dozen, six of whom would be imbeciles and six be normal persons. The retort of the expert analyst was simply to abuse the psychologist who had asked the question. Vocational character analysts by observational methods have never yet been willing to submit to any such exhibition of their powers as was indicated by the psychologist in that audience.

A few years ago Professor Rudolph Pintner of the Department of Psychology in the Ohio State University made some experiments to determine how accurately persons may be sized up by their looks. He selected five classes of observers. The

first class was composed of nine physicians, two of whom were general practitioners and five were specialists. A physician has an unusual opportunity to gain experience in reading people by observation. The second group was composed of fifteen psychologists, fourteen of whom were experts in giving mental tests, seven had had experience in abnormal psychology. The third group consisted of eleven students who were studying feeble minded and carrying on a course in mental measurements. The fourth group consisted of seventeen teachers who were taking a summer course in mental measurements. The fifth group was composed of eleven persons who might well be classified as miscellaneous. Three of them were business men, one was a married woman, and seven were stenographers. All of these sixty-three persons were fairly well equipped to size up persons by observational methods.

Professor Pintner and this group of sixty-three persons approved an intelligence test which they agreed would indicate satisfactorily the intellectual standard and ability of the persons examined. Then these tests were given to twelve persons who were called in. Then these sixty-three observers looked over the twelve and each of the sixty-three rated these twelve in order of intelligence. Some of the interesting things about the ratings were that the one who stood highest in the standard test was ranked fourth by the observational method, that the one who stood next to highest in the standard test was ranked ninth by the observational method, that the one who was ranked as the most intelligent by the observational method proved to be number three when ranked by the standard test. The one who was ranked as next to the most intelligent one of the group proved to be next to the lowest by the standard test. The one ranked in second place by the observational method was a girl who was an inmate of an imbecile asylum.

What one can do depends upon what he knows and no one

can tell what another knows simply by looking at him. He has to resort to other means. It is all very well to say that color, form, size, structure, texture, etc., is at the basis of character development, but to select men and women for a vocation one must take into consideration the education and the experience.

The observational method has not succeeded satisfactorily except occasionally. It is rather difficult to check up the results of the observational method because in most cases the advice given by the analyst is in very general terms, and then one needs to go out and apply that advice for a series of years before he knows whether or not he can succeed by following it.

Vocational advice, to be of any real service, should be such as will enable one to know his own ability. We are all familiar with the fact that experiences of life do show to a degree in the expressions of the faces, but by observational methods one can never tell whether a worried look is caused by business, religious, or domestic difficulties. Then, too, there are no deeply marked lines written in the faces of boys and girls. They have not gone thru the experiences of life and so their faces do not tell very much. And yet that is the time when vocational advice, to be of any real value, should be given.

**Forms of Tests.**—There have been several forms of tests worked out in order to determine what one can do. Hollingworth names several of these. One is the Vocational Miniature. This is a plan in which from the entire piece of work to be done some selected and important part of it is reproduced on a smaller scale by using toy apparatus or in some way duplicating the actual situation which the worker faces when at his task. The second is having an actual piece of work done and judging the candidate's ability by his success in this trial. Stenographers, bookkeepers, and others can be tested in this way. The third method that has been tried is that of analogy.

Some test is devised which bears some real or supposed resemblance to the situation which the worker will find in the given occupational activity. Tests have been applied to girls who are to sort steel ball-bearings by testing their speed of reaction to a sound stimulus. The fourth test is known as the substitution test, in which certain characters are always to be replaced by certain others according to a prescribed key. The speed of improvement is chosen as the thing of interest in respect to the test. One's ability to improve gives an indication of his aptitude for the task. The test records and ability in a particular type of work do correspond very closely with the ability of the individual to carry on the proposed type of work. Another, and the one which is quite usually employed, is the ability in doing the actual work under the normal conditions which prevail. This has been followed perhaps longer than any of the other schemes. If the one given a trial succeeds, he is continued in the position, if he does not succeed he is replaced by another. Another method of testing individuals has been to make a study of the records which they have made as students in school and compare these records with their success in later work. Thorndyke has done considerable work along this line and seems to have arrived at the conclusion that one's school records give a fair indication of his ability to succeed in the thing he likes. That is, a person's interests are an accurate index of his relative capabilities.

Most of these vocational tests have as an object the selection of a person who can do satisfactorily a piece of work required. If the person succeeds in doing that work satisfactorily the situation, in the eyes of the employer, seems to have been met; but there is another phase of the whole problem of vocational guidance which has not received as much consideration as it should, and that is the interest of the individual who is being tested. The foregoing tests make very little headway

in showing what one can do. They succeed better in showing that he can or cannot do a particular thing.

Vocational tests properly applied will help the individual discover his abilities and capabilities so that he may find the field in which he has fair prospects of success rather than to be shown that he cannot succeed at this particular line. For someone to prove to an individual that he cannot succeed as a stenographer does not meet his most important problem which is to find out in what line he does have some chance of succeeding.

**Psychological Tests.**—Psychological tests worked out under the direction of the government and known as the Army Intelligence Tests, which are an application of the Binet-Simon-Stanford Revised Tests, have made greater headway in this respect than has been made before. As we all know, the government realized the necessity of recruiting and organizing its army and navy forces in such a way that men of special ability could be so placed that their ability could be used to advantage; and in order to devise a method of discovering this a number of leading psychologists (but not a phrenologist or a physiognomist) of the country were invited in and plans were made for examining men in such a way as to test their general intelligence.

**Not All Free and Equal.**—It has been known for centuries that all human beings are not created free and equal. Teachers have always known that there are some pupils who cannot grasp material which others comprehend readily. About twenty years ago the minister of public instruction in Paris named a commission which was charged with the study of measurements to be taken, showing the benefits of instruction for defective children; that is, those children who were apparently not quite normal. One member of that commission worked out an extremely useful guide in a series of tests. His

name is Alfred Binet and the scheme he worked out is known as the Binet Test. This test served as a basis for the Binet-Simon-Stanford Revised Tests, the purpose of which is to determine not the knowledge which one possesses but the intellectual level at which he stands.

**Knowledge and Intelligence.**—There has always been, and still is, considerable confusion in regard to knowledge and intelligence. They are not the same. Intelligence is the native ability which one has and knowledge is what is acquired. For instance, there are some persons who can never be taught the method of extracting cube root, even the routine process. There are others who not only comprehend the routine process but understand the fundamental principles underlying the extracting of cube root. Also there are many persons who can use a table of logarithms in computation who would never be able to develop the underlying principles and derive a table of logarithms. The one case, that of learning to apply, indicates knowledge; the ability to comprehend underlying principles indicates intelligence. In all likelihood, Abraham Lincoln never understood and never knew how to extract the cube root. His knowledge in that particular line was limited, but no one doubts that he had the ability to have grasped readily the fundamental principles underlying cube root had they been called to his attention.

**Innate Potentialities.**—Every individual is born with certain mental potentialities. These unfold from birth until the upper limit is reached. No one knows what that limit will be, but if we find a child remaining at the same intellectual level for a period of two years or so, we may feel sure that he will never pass much beyond that level. These potentialities serve to indicate what one can do with what he knows. The limit of one's ability to do shows itself in emergencies. One upon a low intellectual level and one upon a high intellectual level may

be taught to do the same thing or carry out the same process. So long as no difficulty arises both succeed fairly well, but if an emergency arises the one of the low intellectual level is helpless or does the wrong thing as often as he does the right thing, while the one of a higher intellectual level comprehends the underlying principles of the process and is able to do the right thing at the right time.

A person may have a good deal of knowledge and have a rather low degree of intelligence. It is possible for one to memorize a great many facts without a high degree of intelligence, but he must have intelligence to associate those facts properly and use them to any advantage. One on a low intellectual level cannot make much use of knowledge. He may know many things but he cannot do anything with them.

**Army Tests.**—The Army Intelligence Tests were applied to more than 1,735,000 men. These men were selected from all stations in life and so represent a vertical section of American intelligence. These tests aimed to rate men according to their intellectual level, and the rating of these men served as a fairly accurate index of their ability to learn, to think accurately under pressure, to analyze situations, to maintain a state of mental alertness, and to comprehend and follow instructions.

Eighty-two percent of the officers in the American army were taken from classes "A" and "B" of this test. The lowest 10 percent of our army was kept at home, and there is no doubt that the effectiveness of our army in Europe was due to the grading of the men.

The Binet-Simon-Stanford scale rates persons according to intellectual level by years instead of by age. The classification and meaning is given in the table on opposite page.

From this table you will note that those who stand in class "D"—seldom go beyond the third or fourth grade in school. They do not have the mental ability to master work

## INTELLIGENCE TESTS AND WHAT THEY SHOW

Binet-Simon-Stanford Tests	Mental Age in Years	Grade in Army Intelligence Tests	Points in Army Grades	Estimated % of Men in Each Grade	Estimated % of Population in U. S. in Each Grade	Interpretation of Grades
0-9	Below 10	D —	0-14	10%	11 millions	These seldom go beyond 3rd or 4th grade in school. Most menial work.
10-19	10	D	15-24	15%	16½ millions	
20-34	11	C —	25-44	20%	22 millions	Inferior mentally, fit only for regular service under close supervision. Seldom go beyond 5th and 6th grade in public school.
35-44	12					
45-59	13					
60-74	14	C	45-74	25%	27½ millions	Low intelligence. Cannot make simple written reports. Fit for routine work in army and in civil life. Seldom go beyond 7th and 8th grades in public school.
75-89	15	C +	75-104	16¼%	18½ millions	Rarely finish high school. Fitted for rank of private in army and simpler skilled work in civil life.
90-114	16	B	105-134	9%	9½ millions	Make average high school record. Furnish N. C. O.'s in army. Skilled workers and foremen in non-technical industries in civil life.
115-134	17					
135-159	18					
160-212	19	A	135-212	4½%	4½ millions	Superior men. Equal the average record in college and technical schools. Furnish C. O.'s of army and foremen and superintendents of departments in the more technical and skilled industries.

beyond those grades, therefore they lose interest and drop out. You will note that those in class "C" rarely finish high school, that they are fitted for the rank of private in the army and for

the simpler skilled work in civil life. They make up the large group in our population, whether on farms, industries, or trades, whose work has to be supervised. Class "A" is made up of the very superior, the best intellectual type, those who make large plans and direct the executing of those plans, who plan and operate railroads, organize and administer colleges, furnish the best type of statesmen and administrators. It is interesting to note also from the above table, taking our population as about 100,000,000, that 83,720,000 of our people are below the intellectual level of 15½ years and that only 16,280,000 of our people are in the two upper classes.

**Alpha and Beta.**—The Army Intelligence Tests provided two types of test—the Alpha and the Beta. The Alpha tests were a series of written ones in which the total number of points were 212, as is seen in the above table. These tests were carried out by following instructions given by the examiner. The Beta tests were those used for persons who could not read the English language. These tests provide for the doing of things according to direction. The army report indicates that it has been thoroughly demonstrated that the intelligence ratings proved very helpful in indicating a man's probable value in the service. For instance, in a unit about to go over seas a number of men would be designated by the commanding officers as unfit for overseas service, then these men were referred for psychological examination with the result that 90 percent of those so referred proved to be of the intellectual level of ten years or lower and were kept at home.

There seems to be no reason why some modified form of the Army Intelligence Test cannot be applied to all persons in order to determine their intellectual level, and when that level is determined, change the method of instruction of such persons

who are of school age and give them the widest knowledge possible that comes within their comprehension. For instance, if a boy is found to be at the intellectual level of twelve years he should be taught routine work and processes which are at that level, rather than to try to drag him on thru high school thru courses of instruction, the fundamental principles of which are beyond his comprehension.

**Occupations and Professions.**—This whole plan entails another great task, that is of discovering just what intellectual ability is required to master various positions in our various industrial and social life. There must be carried on a study of all the activities of our modern life so that there may be known the qualifications required for success. For example, it is quite likely that the president of a great university might make a first class ditch-digger, perhaps could learn to dig ditches as well as a "C plus" man, but it certainly would not be economy to keep him digging ditches. It is not enough to find out what one can do well, but to discover his abilities and enable him to find a position which shall call for all of his ability. If one of class "C" is put at a class "B" task, it is beyond his ability to perform with ease and satisfaction and he will become irritable and a disturbing influence in industry. If a class "B" man is put at a class "C" task only a part of his ability is required. He has a mental leisure which makes him uneasy. He cannot put all of his efforts into the task and he becomes a disturbing element in industry. We examine doctors, lawyers, accountants, pharmacists, etc., why not everyone?

Let us think for a moment what the psychology of the situation means. Think of the average normal boy from ten to fifteen and a half years of age and then recall that 85  $\frac{1}{5}$  percent in industry fall intellectually into that group and then remember that the gang instinct which exists among boys from

twelve to fourteen years of age is one that binds them together in the closest relationship and then realize that the great body of workers in industry in America are largely men of foreign races who have come to America as a land of liberty, of great wealth, and wide freedom which they have never known in their home lands and that the great majority of these are at the intellectual level of boys twelve to fourteen years of age. They cannot speak our language. They fall under the influence of a gang leader and many times a leader of low motives. They are part of the crowd and are controlled by the psychology of the crowd.

Many a man of a high intellectual level, but who does not know our language, is compelled to accept work with those of less intellectual ability. He notes what he thinks are wrongs visited upon them. His task does not require all of his ability and often he becomes the disturbing element in the labor organization. *These men are bound to be led* but they ought to be classified and led by those who understand their ability and can fit them into the position which they are qualified to fill.

Not only is this true in industry but it is true in politics. About  $85\frac{1}{5}$  percent of our votes are cast by persons below the intellectual level of  $15\frac{1}{2}$  years. They are not able to consider intelligently the policies or programs advocated by political leaders. They are won by emotional appeals and yet a "C minus" man exerts as much influence at the ballot box as a class "A" man. What psychology is teaching us is that the persons of class "B" and "A" must assume responsibility for the direction of the classes below them and direct those classes in the interests of the classes rather than in the interests of the leaders. Political campaigns are lost or won by catch-words and slogans, not by a consideration of vital economic or social principles. We have many examples in American history.

One presidential campaign was conducted on the slogan of "54-40 or fight," another on "Tippecanoe and Tyler too," one on "The Full Dinner Pail," one was lost on "Rum, Romanism, and Rebellion."

We must face the question of responsibility. It is very well to advocate equal rights if we understand what we are talking about. Men are not created free and equal. Equal rights do not necessarily mean the same rights. Parents and children in the home have equal rights but they do not have the same rights. Think of a man of the intellectual level of twelve years and another of nineteen years. Each one should have those things that minister to the best that he can enjoy. The second one has an appreciation of art and secures a real satisfaction in certain etchings, tapestries, etc. The man of the intellectual level of twelve years has little appreciation of these things. Each is entitled to the things which he can enjoy, the things which will bring him as large a satisfaction as other things bring the other man.

Children with their toys get as much satisfaction out of them as their parents get with a Packard Twin-six. You might as well say that every child should have a Twin-six if his father has one, because democracy means equality. That cannot be, and somehow society must be led to see it. Justice means that each one shall have an opportunity to realize his desires to the full extent of his ability. Some day, somehow, that idea must be carried into politics and into industry. Somehow our leaders, political and industrial, capitalists and laborers, must come to recognize that fact. Psychology is making this great contribution thru a study of men and in discovering a method of arriving at their intellectual levels so that each may be directed to an activity in which his ability may be used to the full.

The Intelligence Tests, as used in the army, coordinate very closely with the grading of persons according to wages earned and according to the ages at which they leave school. The table opposite used by Goddard and taken from the Department of Labor report on wages, the Department of Education report, and the report of the Army Intelligence Tests, bears this out :

It is noted in the above table that the 9 percent who earned \$150.00 or \$200.00 a year are about on a par with the 13 percent who left school in the 4th grade at the age of ten years and that these fall in with the 10 percent in the "D"— group of the Army Intelligence Test at the mental age of ten, and a similar result will be found in the others. This illustrates again the fact that what one can do depends upon what he knows, and his ability to know can be quite accurately determined by an intelligence test.

Mental tests modeled after the Army Alpha tests have been used in the State Institutions of New Jersey for the last six years and have proven very satisfactory. They have helped to discover the individual and by a thoro analysis of the individual and the work to be done the directors are able to put men at the work which they can do well and be happy in doing. These intelligence tests have been used in the selecting of high grade executives with great satisfaction to all concerned.

When one's intellectual level has been determined he is on the way to make a satisfactory place for himself in present day civilization. Psychology enables one to understand himself and to understand others so that he may be in a position to use his ability to the best advantage.

**Success.**—All of these things have a bearing on what we usually have in mind when we speak of success. Psychology is making it clear every day that real success depends not upon

WAGES of 100 wage earners		SCHOOL of 100 children		
9%	Earn \$150-\$200	13%	Leave in 4th Grade, Age 10	10% in "D—" Group, Mental Age 10
12	" 250- 300	13	" " 5th " 11	15 " "D" " 11
16	" 350- 400	14	" " 6th " 12	20 " "C—" " 12
31	" 450- 600	27	" " 7th 8th " 13, 14	25 " "C" " 13-14
68	" less than \$15 per week	67	Do not finish 8th	70 Are below " 15
27	" \$700-\$1000	23	Leave after 8th	16½ in "C" Group, Mental Age 15
3	" \$1250	10	Attend H. S.	9 " "B" " 16, 17
2	" over \$1250	3	Graduate H. S.	4½ " "A" " 18, 19
		1.5	Go to college	

money, position, or power, but it depends upon service rendered. Someone has stated it as follows:

#### SUCCESS

It's doing your job the best you can  
And being just to your fellow-man;  
It's making money, but holding friends,  
And staying true to your aims and ends;  
It's figuring how and learning why,  
And looking forward and thinking high,  
And dreaming a little and doing much;  
It's always keeping in closest touch  
With what is finest in word and deed;  
It's being thoro, yet making speed;  
It's struggling on with a will to win,  
But taking loss with a cheerful grin;  
It's sharing sorrow and work and mirth  
And making better this good old earth;  
It's serving, striving, through strain and stress,  
It's doing your noblest—that's success.

—*The American Press.*

More and more it is becoming clear to far-seeing men that the great business of modern civilization is the making of men, that before one can be a real lawyer, a real clergyman, a real doctor, he must be a man; that the first great business of industry is not the making of goods but the making of men and that conditions in industry must be such that there shall be aroused those impulses, desires, and ambitions in the men which tend to establish confidence in their minds toward those who do the planning. It is true also of the individual, as he thinks of his own future development. His chief aim should not be the securing of a larger salary, a more prominent position, the possession of more power, but by all means possible to make of himself a bigger, broader, wiser man. That is the foundation upon which all of these others are built, if they are ever built.

The idea of service is rather new in our civilization, altho the word is old. The great difficulty with modern industry is that it has not learned what the word "service" means. Mod-

ern business has not yet been put on a "service" basis and it will not be until business is made a profession with a rank somewhat akin to the professions of law, medicine, the ministry, dentistry, teaching, etc. The difference between a profession and business as it is now conducted rests almost entirely in the attitude toward service. The business man looks forward to the time when he will have secured a competency and then will retire, and after that render some service to the community. If this idea is the correct one, it is not possible for anyone to render effective service to his community unless he can acquire a competency, but this viewpoint is wrong. The business man must serve the community thru his business and the laboring man must serve the community thru his labors.

Men enter the different professions with the dominant idea of serving the community. Incidentally they expect to make a living and if they are successful and fortunate, perhaps to acquire a competency, at least sufficient for the exigencies of old age. The doctor takes up the study of medicine because he believes it will give him his greatest opportunity to serve humanity. The lawyer of noble ideals enters the profession of the law for the same purpose. Men enter the ministry of the various churches because they believe they have the largest opportunity to serve humanity, but up to the present time men have entered business for the sole purpose of making money, some of them hoping that after they have made it they may use some of it for the good of society.

The same attitude of mind pretty generally prevails thruout society. The laborer works for wages, and not because he expects to serve anybody. And if he secures the wages and the hours that meet his demands he is satisfied. The best type of civilization will never again be satisfied with men who work simply for wages or who conduct business enterprises simply for profit. Psychology makes it perfectly clear

to the world today that no man can be his best who does not render a service to humanity beyond that for which he is paid.

Someone has called attention to the fact that three great maxims have been expressed at different periods of the world's history and they have a bearing on the matter of success. One is that statement of Socrates, "Know thyself." It is the place for man to begin and it is the task which will engage his attention to the last. A thoro attempt for one to know himself leads to knowledge of science and of culture and lifts him out of the rut to the broad highway of accomplishment.

Another statement is that of Marcus Aurelius, "Control thyself." Many a man has knowledge of facts and of principles, knows something of himself, and yet for some reason does not have the power and the ability to invest that effort to satisfactory ends. But one who has gained self-control finds that it leads to morality and power and puts into his hands the ability *to do*.

The third maxim is a statement of Jesus of Nazareth, "Deny thyself." One who is imbued with the motives of self-denial, and everyone who accomplishes anything worth while has had to face it, realizes that he must give up the pleasures of the moment and spend the hour in study and contemplation or in hard labor in order to secure the greater satisfaction of a later day. To one who has learned to deny himself the good for the sake of the best, finds that it leads to a life of service and sacrifice which brings the greatest of rewards—the love and confidence of fellow-men.

These things do not come by chance, they come as a result of clear thinking and earnest effort. It is the thinking in the end that determines the status of the man.

A man should be judged, not by cast or creed  
The meat he eats, the vintage that he drinks;  
Not by the way he fights, or loves, or sins,  
But by the quality of the thoughts he thinks.

If one wishes to succeed he must follow the advice of one of the teachers of two thousand years ago, who, in writing to Timothy, said, "Take heed to thyself," and who in another connection said, "Finally, brethren, whatever is true, whatever wins respect, whatever is just, whatever is pure, whatever is lovable, whatever is of good repute, and if there is any other virtue which you regard as particularly excellent, think on these things."

It is becoming more evident every day that cooperation must supersede competition, that democracy must replace autocracy. Instead of war peace must come in industry, politics, and religion. Men can no longer attain real success by trampling others under foot. Men can not be made Christian by fagot, rack, and wheel. They may be scared away from hell, but they cannot be driven into heaven. Men in industry may be driven to labor but it is an expensive process. Exploiting by the employer and shirking by the employees is ruinous to any business and both groups must learn it. The best efforts of men cannot be bought with wages. That can be accomplished thru appealing to the best in men and that can be accomplished only by implanting in the minds of all concerned in any enterprise the idea of cooperation. *We* must work together, husband and wife, employer and employee, teacher and pupil, physician and patient, lawyer and client, producer and consumer, rich and poor, intelligent and ignorant. "No man liveth to himself alone." Your success depends upon thousands and not upon yourself alone. Your family, neighborhood, industry, nation, the world is not safe so long as any individual anywhere is not safe. I must defend your rights whether you wish me to or not, because when your rights are jeopardized mine are, when you suffer I do, when Europe suffers America pays. The peoples of the world are feeling their interdependence as never before. You cannot become educated

and everyone else remain ignorant; you cannot succeed and everyone else fail; you cannot make the most of yourself without helping every one of your associates to make the most of himself.

There are some fundamental elements that must find a place in the motives of every person who deserves success in life. Let me name a few of them. Your attitude toward them should be settled once for all. They are:

(1) **Know and Not Guess.**—Determine that as far as it is possible you will know for yourself and not depend upon the opinions or guesses of others. Determine that you will know some one thing better than anyone else knows it, and that you will make yourself capable of doing some one thing better than anyone else can do it.

(2) **Stand for the Right.**—Determine that at all hazards you will stand for the right as it is given you to see the right. Never let it be honestly said of you that “expediency is the better part of valor” when questions of right enter in. When one has so determined, the only question involved is to decide what is right. To determine the right is not always easy, but when it is determined, stand for it at all costs. One may find a thousand reasons to justify, in the eyes of others, the things he does, but he can never justify unrighteous acts in his own eyes. One must live with himself not only during the activities of the day, but also thru the long watches of the night when friends, companions, and fellow-workers have gone their way.

(3) **Follow Truth Wherever it Leads.**—“Ye shall know the truth and the truth shall make you free,” and it is the only thing that will, but one who turns his face away from the light of truth becomes a slave, the meanest one can know. The world has known thousands who would die for the truth, as we have millions who would die for our country, but what the

world needs is men who will *live* for truth, and men who will *live* for country.

(4) **Grant Justice Before You Demand It.** —The sur-est way to insure justice is to practise being just. No one has any right to demand from another what he has not already made a principle of action in his own life. Too many men go thru life *fighting* for their rights. "It is more blessed to give than it is to receive." There is more real satisfaction in *granting* rights to others than there is in *fighting* for your own. The best thing about your own right is that you can surrender it.

(5) **Serve Before You Ask Service.**—Instead of fretting because your employer, parents, friends do not do as much for you as you think they ought, try doing the most you can for them. Instead of waiting for the person you meet to extend a greeting, try expressing a hearty "How d'y do!" yourself. Try proving yourself a Good Samaritan when men are in trouble instead of acting the priest and the Levite. "Whosoever would be *great* among you shall be your servant; and whosoever would be *first* shall be the servant of *all*."

The spirit of service indicates a willingness to do a little more than is expected, a willingness to do for those in trouble or in need and do it without hope of reward except the satisfaction that comes in the doing. It is just the opposite of the spirit which "levies all the traffic will bear."

(6) **Forgive Before You Ask Forgiveness.**—Most of the hard, unkind things are said without sensing their real import. Most unkind acts are done while one is "in a temper." Many times friendships are broken and happiness ruined because we will not forgive. We hold a grudge and wait to get even. It requires a much bigger mind to forgive than it does to ask forgiveness. It requires courage to ask forgiveness, but it requires a master mind to grant it. Forgiveness means that

the old relations have been reestablished, and that the one who has forgiven forgets the action or the word forgiven and treats the one forgiven as tho he had never committed the act. The one who forgives overlooks what has been done and never calls the attention of others to what he has done. Of course the one who has been forgiven never forgets it. The joy of forgiveness is his and he is thereafter in duty bound to grant that same measure of happiness to all who seek forgiveness from him.

**(7) Ask for Yourself Only What You Ask for All.—**

Do you wish for opportunities for success? Then you must ask similar opportunities for others. Do you desire shorter hours of labor for those in your trade? Then demand shorter hours for all trades. Do you want better living conditions for your family? Then ask better conditions for all. In reality you must apply the Golden Rule in its widest reaches. Whatsoever ye would that men should do unto you at *any* time, in *any* place, under *any* circumstances, that you ought to do to *all* men, at *all* times, in *all* places, under *all* circumstances.

The aim of this book is to help you understand yourself so that you may make the most of yourself and win for yourself a degree of success commensurate with your ideals. The application of the principles herein laid down will help you to that end.

“Build thee more stately mansions, O my soul,  
As the swift seasons roll!  
Leave thy low vaulted past!  
Let each new temple, nobler than the last,  
Shut thee from heaven with a dome more vast,  
Till thou at length art free,  
Leaving thine outgrown shell by life’s unresting sea!”

## CHAPTER XIII

### GROUPS AND RACES

IN the preceding chapters we have considered the development of the mind of the individual, and the resultant behavior as he has reacted to his environment, but that environment has been almost entirely viewed as that of the physical universe. It will be our aim now to give some attention to the individual as one of a group, and try to discover what the effect of the group is upon the individual and vice versa.

**New Ideas.**—This will appear important as soon as we remind ourselves that most of our great unsolved problems are social problems, and that social problems must be solved by social groups and not by individuals. Of course there is a large place for individual thought and initiative. Social groups do not develop new ideas. A new idea is always the product of a single brain. Some individual thinks beyond his group and acts in accordance with his thinking and then there may be progress. Thoughts do not emerge from "collective consciousness," but always bear the stamp of individuality. Changes are made in the behavior of the group from time to time because some keen individual gives a new emphasis to some idea already in the minds of members of the group, or suggests some new form of action to accomplish an old purpose, and the group follows his suggestion.

The individual was born of a community and into a community and will live in community probably and that community will continue to exist after he is dead. He learns the

language of the group or community. In learning the language, he learned the ideas of the group. He imitates the actions of the group as they have been, now are, and will continue to be except as such changes as have been referred to above may enter into and slightly modify the customs and habits.

**Group Consciousness.**—The group consciousness is the source from which the individual gets his manner of speech, his habits of thought and his way of doing things and is the court of last resort in deciding what is fact. The experience of any one individual may be duplicated by some or many or none of the group. If it is duplicated by any appreciable number, then the one whose experience has been duplicated may appeal to the common consciousness of the group. It then becomes a fact of group consciousness. If no one finds his experience agreeing with the claims of the first, it will be set down in the minds of the group as untrue.

This not only holds true in regard to facts apprehended through the senses, but is also true in regard to those inner feelings, thoughts, desires of men. It may be fear, alarm, some common purpose, awe, or what-not. If it is common to the group and experienced by them all, it is a fact of their common consciousness, and they will, so far as action is necessary, act upon that common consciousness.

**Enlarging Consciousness.**—We pointed out at the end of Chapter One that the aim of the individual should be to enlarge continuously his self-consciousness. It is equally necessary for the group if it is to make any progress as a social factor or unit. The enlarging of the consciousness of the individual comes through contact with teachers, parents, and all of the older members of the group until he reached adulthood. In most cases thereafter little or no thought is given by him to continuing the process of growth. So there is a tendency for

the group to follow its traditions and customs and unless thrown out of equilibrium to make no determined effort toward broadening or deepening its consciousness. The social consciousness opposes individual independence. It insists on conformity. The group believes that the individual's welfare is best conserved by such conformity. Things have always been done this way. Why change now?

The smallest social group is the family and in spite of all the attempts that have been made to destroy it, it still persists and persists because it is social. With the appearance of the family a new set of laws begins to operate. The unit of selection is changed. It is no longer the survival of the fittest individual but the fittest family, that is, the group. The struggle is now shifted from individuals to groups. Among primitive men there seems to have been constant warfare between families. There is said to be no word for friend in primitive languages. The stranger was always an enemy and the only thing to do with an enemy was to kill him. Then it was discovered that a dead enemy was less valuable than a live slave, so the conquered enemy was enslaved and made to work. When it became economically unprofitable to continue slavery, the slaves were freed, and later educated and still later called friends and perchance sometime will be called brothers.

With every advanced stage of this development there appeared an enlarging consciousness of the group. Those acts which proved economically profitable, came to be regarded as good, and later as right. Those that were economically unprofitable were bad, and later came to be looked upon as wrong. So murder, slavery, and concubinage have come to be looked upon by most civilized peoples as wrong, although some people living in civilized communities still practice them, especially the last.

**Psychological Factors.**—The intellectual difference be-

tween man of six thousand years ago and now is comparatively slight. The difference in civilization is enormous. Man has made civilization thru social organization and in turn social organization has made man. Man is extremely individualistic. He becomes socially minded only when he is better cared for and better fed. Thru the long process during the ages he has learned that he can control to a large degree his environment. Society has not always existed. Man has made it and he has discovered that he can remake it. So we find man at the end of the first quarter of the twentieth century with an equipment which he has provided himself but which he has not learned to use to the best advantages in all respects, but with some hope of making more rapid progress in the coming years.

Man is much more familiar with the structure of society than he is with its functions and as the outstanding evils of our day are evils of function, it will require patient endeavor and, may be, some real struggle to discover the solution for some of our problems. This is because the remedy for our evils lies not so much in the political realm as some have thot. We have come to the place where the first thing many of us think of in the face of a problem of society is to have a law passed to correct it. We seem to think that everything can be done by law. To be sure, the universe is operated according to law but not by such laws as congress or our state legislatures make. The psychological factors are coming to play a very much larger part in the solution of our modern problems than many are aware of.

Man has shown indomitable courage and keen insight in discovering means for controlling the earth, air, and water, in the treatment and banishment of disease, in plant and animal breeding. Can he show as much in controlling himself? Can a group consciousness be developed that will actually sense the

evils needing correction and then discover and apply a remedy? Can a group be led to think in terms of the whole, the whole community, the whole state, the whole nation, the whole world? Is the race still too provincial to deal with such large problems? Is ignorance too great, prejudice too strong, or indifference too deadening

We have evidence that about 25% of our population can not read well enough to be classified with the literates and that about as many more could hardly understand what one is driving at in discussing such problems as society and the state have to face. Some light might filter thru into the minds of some of these but there is little hope of any suggested solution coming from that source. Some one else must make the suggestion and then help create a social or group consciousness that will result in securing a following from among the 50%, or at least enough of a following to enable the group to act in accordance with the judgment of the best of the group. This again is a psychological matter, not political altho many men play politics with it.

By playing politics I mean any attempt to trade upon the ignorance, fears, prejudices of the group in order that their support may be secured for some scheme that will serve the interests of the few rather than serve the best interests of the many. This feeling is expressed often in the saying "He's a typical politician" which is equivalent to saying, "Look out for him. You never know what he is up to."

**Motives.**—The only corrective for such situations is found, I believe, in such principles as were referred to in the last chapter. They apply in individual relationships, family relationships, group relationships, all relationships. Unless we suggest such remedies for the solving of problems of relationships as will serve the best interests of all concerned, there is little hope of improvement. To that end it seems necessary that in some

way the group shall discover ways of determining the motives of those who aspire to leadership.

When individuals or groups face a problem or a supposed problem certain feelings are aroused which make us uneasy. These feelings are often aroused by agitators who have come in to save the situation. As a result of the disturbed feelings certain ideas are produced. Then we try to find what seems to us logical reasons for holding the ideas. Such ideas so aroused and so held and so bolstered up are what we mean by prejudice. What we experience by actually living thru events is a very small part of all we think about and feel about. We have few prejudices about what we have lived thru but we have many and strong ones about what we have talked about and what we have heard others talk about. We acquire prejudices before we have any experience at all in a particular situation and then, if we later happen to have any experience in that line, we interpret it in terms of our prejudices. This prevents us from seeing the matter as it actually is, and also makes us quite unwilling to reopen the matter later.

Prejudice is not confined to the ignorant and uneducated. It is found among all classes. We saw in an earlier chapter that the ignorant man is a poor workman, but we can go further and say that he is a poor politician, a poor employer, a poor husband, a poor father, a poor anything, but when ignorance is tied to prejudice, it is the most dangerous combination modern civilization has to face. Prejudice among the educated classes as among the ignorant is often unrecognized by those who hold it. Some 100% Americans are so sincere that they almost convince us that what they say represents the truth, and then we discover that while they are quite well informed about some things they are woefully ignorant in regard to others, but that knowing some things they have assumed others hoping they may be true and so come to believe them to be.

Such persons are dangerous anywhere in any walk of life. They are not fit to lead and they will not follow. Such leaders in the end wreck whatever they touch.

Many men who recognize the power of prejudice are not above appealing to it for their own selfish ends. They seem to follow the motto, "The end justifies the means." An example of this may be seen in the reports of a United States senator's campaign for reelection to the senate. The senator had the reputation of being opposed to Japanese immigration. During his campaign literature was distributed with the demand, "Keep California white." Some one connected with the management of the campaign soon discovered that there were many Negroes in that state who were voters and the call to "Keep California white" did not attract them. Then the motto was changed and became, "Keep California American." One would judge from this report that while the senator wanted to oppose the Japanese, he desired much more to be reelected. Then the question of sincerity arises, and we feel that we need more facts than his campaign presented.

A similar situation was indicated a few years ago when the Navy League was advocating preparedness. Congressman Tavener laid bare some of the relations existing between the Navy League and the great steel companies, the nickel manufacturers and the munitions manufacturers, and again we felt that we were not being furnished all the facts as to motive when the cry for preparedness was presented. Was the real aim to protect the nation or to sell munitions? We did not know. Was it in the interests of the many or in the interests of the few?

**Race Antagonisms.**—When one reads from a recent book such statements as the following he wonders just what the motive is. "As colored men realized the significance of it all [The white man rushing to destruction thru war] *they looked*

*into each other's eyes and there saw the light of undreamed hopes."* "The colored world, long restive under white domination, is being welded by the most fundamental of instincts, the instinct of self-preservation. . . ." "Further white expansion in the Far East has become impossible. Any such attempt *would instantly* weld together Japanese imperialism and Chinese nationalism in a *sacred union*, etc." "This is the secret of her [Japan's] *aggressive foreign policy*, her *chronic imperialism*, her *extravagant dreams of conquest and world dominion*. . . ." "Bound together by something subtle and intangible, the brown men of Asia *everywhere* face the white man in *sullen hostility*." "Relations between whites and blacks *are bad* in South Africa, and *are becoming worse*." "The menace of Bolshevism is *simply incalculable*." "We whites will have to abandon our tacit assumption of permanent domination over Asia, while the Asiatics will have to forego their dreams of migration to white lands and penetration of Africa and Latin America." "Even within the white world, migration of lower human types like those who *have worked havoc* in the United States must be *rigorously curtailed*. . . ." The italics are mine. When one reads such statements as those quoted, he can hardly help but feel that while there may be some truth contained in them, there is more feeling and considerable prejudice. The author seems more intent upon giving us his conclusions than he is in showing how and why he arrived at them, which is always a bad plan if one wishes to serve all concerned. We feel like calling another witness who knows something about the other side of the question, and who will give us more light and less heat.

Elbert H. Gary, writing in *Collier's Weekly* for February 14, 1925, on the immigration question says:

**Japanese.**—"Published declarations that war between Japan and the United States is threatened arise largely from *an*

*attempt on the part of minorities in each country to inflame the public mind* and, if possible, to precipitate serious trouble. In some cases, perhaps, the jingoes are sincere and express their honest beliefs, but in the majority of instances I think the *motives behind the efforts to bring about trouble are unworthy and reprehensible*. Certainly they do not represent the mass of opinion nor the prevailing general sentiment of the country.

*"As a whole the people of the United States entertain for the Japanese a feeling of cordial, sincere and abiding friendship. This includes the President of the United States and his Cabinet.* It also includes those members of the Congress of the United States who are not influenced solely by personal political interests when they vote.

"In some parts of the country the labor elements are antagonistic to the increase of Japanese inhabitants for the reason that the Japanese are thrifty, industrious and economical and, consequently, furnish a competition in industry that is supposed to affect the earnings of the other working nationals. *This, of course, is selfish and unreasonable, and would be disapproved by every fair-minded, intelligent American citizen.* All nationals of foreign strain start with a low wage and steadily work themselves up to the American standard both of income and living. The man on the street insists that competition is good for business and business men. It is equally good for labor.

"The question of permitting immigration of Orientals to this country is, however, a political one and must be determined by the laws of the land. It seems to me that the true solution of the Japanese problem is *to find some fair basis for the admission to this country of a limited number of Japanese, governed and controlled by a percentage plan similar to the one that applies to immigrants from other countries.*

"What the Japanese objects to is discrimination against him

simply because of the color of his skin. It is not to be wondered that he makes this objection. The Japanese are a strong, virile, intelligent, fair-minded people; they are certain to occupy a leading position in the ranks of nations. They stand for civilization, for stability and the creation and enforcement of sound and progressive laws. *They are peace-loving; they do not desire war with any other country.* They are farsighted and understand the necessity and the propriety of being ready for war in self-defense. In this respect they are in no wise different from the British or the Americans or the French or the Italians. It would be very foolish for Japan to be totally unprepared if unprovoked war should be forced upon her. The same is true of the United States and all other countries.

"As business neighbors the Japanese are very desirable. *Those of us who have dealt with them have found them honest, fair and in every respect equal to the best.* Geographical boundaries have made Japan and the United States near neighbors as distance is now measured. The two countries have the same interests in the Pacific Ocean, and for years to come, if not permanently, will be called upon to protect it against tyranny, lawlessness and oppression from any source. We should cultivate the friendship of Japan and, likewise, the Japanese should do everything possible to secure and hold the friendship of the United States.

"Indeed, in my opinion, there is no real danger of war between the two countries. Both realize to the fullest extent that war generally defeats the victor, though this would appear to be a contradiction. It impoverishes a nation and its people. It destroys life. It devastates the land. It brings waste, misery and suffering. It interrupts normal, desirable progress; more, it causes retrogression and places the country back in the calendar of years.

*"Whenever the question of war between these countries is*

*raised, we may consider certain well-recognized principles. No single person knows everything. No one possesses all the virtues, certainly not to the exclusion of others. No individual or nation is always right.*" [The italics are the author's.]

Bishop Fred Fisher of the Methodist Episcopal Church, writing for the *New York Christian Advocate* of February 12, 1925, says:

"The human race is now experiencing a general recrudescence of national and racial consciousness. Just how much the war had to do with this is not certain. The beginning of the century saw mankind consciously drifting toward international comity. The present decade sees us consciously reverting to egoistic claims of superiority.

**Nordics.**—"Among all the things which divide the human race, the most deadly is *the present tendency on the part of self-appointed Nordic specialists to demand mobilization along racial lines.* This is much more terrible than mobilization along patriotic or national lines, for the simple reason that nationality has sometimes been determined by arbitrary and temporary divisions, whereas an appeal to race is more instinctive and atavistic. It is an appeal which will rouse with greater ferociousness all the animal prejudices and instincts. The man or group of men appealing to this prejudice is playing with fire and with the most deadly human explosive.

*"It is a strange thing that the entire group now making this appeal is composed of representatives of the white race, and of a very small section of that race.* One wonders whether the modern howl of Nordics may not be an evidence of conscious decline and therefore the result of fear or deliberate brag. We have all noticed many times in the experience of individuals and of groups that the biggest claim to supremacy is made in the hour of decline. It is a sort of defense mechanism as if fearing competition. In the recent immigration bill adopted by

our American Congress, provision is made for the largest number of immigrants to be admitted from the Federated German States, which group of states was supposed to have come near wrecking the world. Are we not "lightning-change-artists"? First we stir up the youth of America to enlist in a gigantic war to save the world from this terrible Teutonic monster. Then, presto change! we turn around and claim the superior race to be that very race of which the previous German Empire was one of the purest representatives. Did we not hear all our jingoists proclaim the Teutonic "super-man" to be the most terrible psychological fiction which human history had developed? Yet now *we* are laying claim to that very super-racial quality. Certainly all the dark angels of division must be laughing in their lair!

"Furthermore, did we not, during the war, put lowest in the scale those nations which maintained neutrality? Yet the second highest quota in our new immigration bill is given to Sweden and Norway, who remained absolutely neutral and did not participate in the gigantic task of conquering their neighboring Nordic demon, while we exclude our Asiatic ally, Japan. Oh, consistency, thy name is Congressman! Mark you, I am not saying that Norway did not have a right to maintain neutrality, nor am I saying that America was wrong in her fight against Germany. *I am simply calling attention to the strange fact that a few years ago we thought that the whole world had to rise against the Nordic race to save mankind from destruction, and now we seek to place the crown upon the Nordic brow.*

. . . . .

"The white race, all told, represents less than one-third of mankind. European expansion, during the last four hundred years, has gone forward with startling aggression through successive imperial régimes—the Dutch, the Portuguese, the

Spanish, the British, and the American. It matters little whether these systems have been military, political, or economic. *We have gradually expanded, by the use of force, the sphere of European influence, until the European standard of life has become practically universal and compulsory.* When an imperial power wishes to judge whether a subject nation is ready for independent government, it naturally concludes that preparedness for self-government must mean complete equipment to manage government on the European basis—involving European language, customs, transportation, and methods of military and parliamentary procedure.

*"This expansion has given us a jaunty sense of superiority, and we have in many instances mistaken power and the products of education for inherent racial superiority.* It might be conceded that at the present time the white race in general will show a superiority over the Negro race in general. But is it because of inherent racial superiority or because of a larger educational development through a series of generations? *Our sustained emphasis upon education and democracy has paralleled the marvelous scientific discoveries of the last century.* Most of these discoveries and applications have been made by the people who have inherited the advantages of this sustained educational system. Suppose the same methods and processes of education had been applied to the brown or yellow or black race and denied to us. Might they not have been the people to have entered into the scientific discoveries, thereby creating for themselves the tools with which to wield a universal power?

**Education.**—*"A study of the reports of the American army shows that the literate Negroes from the Middle-Western States of the North surpassed the literate Negroes of the South, and also surpassed the literate whites from practically a dozen of the Southern States. The purest Nordics in America are the mountain whites of the South. Is it not, therefore, passing*

strange that these *pure Nordics did not surpass the pure Africans in the intelligence tests?* It will be seen from a similar study that the States of Massachusetts and Rhode Island surpassed certain Middle-Western States. It is a patent fact that a veritable tide of Mediterranean stock has immigrated to New England. Now, according to the crowing of the Nordic cock, the pure Nordics of the Middle States should have surpassed the Mediterraneans of the New England States. But the exact reverse is true. *Professor William C. Bagley has done an inestimable service in calling attention to the fact that very probably the more highly developed educational system of New England caused the Mediterraneans to surpass the Nordics of the Middle West, and the better educational system of the Middle North caused the trained Africans to surpass the Southern whites.* In other words, *it was not race or color of skin, but education that determined the results.*

. . . . .

“Naturally, any one interested in ethnological progress believes in the limited application of eugenic principles, but the height of absurdity is reached when an author regards all philanthropists as enemies of the human race because he claims they are putting crutches in the armpits of the weak races. The true philanthropist, then, becomes one who deliberately shoots down, murders, or chloroforms every unfortunate in the economic, political and physical world! Those who believe in cleaning up the vice sections of a city, whether in the Orient or the Occident, are fools and dreamers, and those who attempt it are ignorant and blind. What they should do is to take a military company into the slums and shoot down all the aged women on the front steps, and all the children in the streets, meantime making certain that the superior class, which lives off the products of the oppressed, shall go scot free and thrive. If we sincerely believe in eugenics, then the only scientific method

of maintaining our place among the races, is to teach birth control to the Indian, to the Chinese, to the Japanese, and to the African. If the white race alone concentrates upon eugenics and birth control, while ignoring all other populations of the world, it must in the end be overrun by the inevitable growth of other peoples. For, after all, history proves that numbers count. *If we sincerely believe in democracy, the safe thing to do is to teach democracy to every race and every community in the world, and likewise to teach them the science, philosophy, and religion which alone make democracy safe.* Democracy in the hands of alleged degenerates is a dangerous weapon. To be consistent, we must do one of two things. *Either act upon the claim to superiority and maintain an absolute monarchy, guaranteeing that the monarchs shall always represent the superior race, and keep all other races in subjection; or act upon a belief in the comparative equality of the races, and consistently teach democracy together with all the arts and sciences which must accompany this doctrine. Herein lies the world's safety and progress.*

**Nordic Rage.**—*"The whole Nordic rage is a false and criminal psychology. Its authors and promoters are prophets of disaster. They are frightened jingoists, mobilizing the white race for defeat. Even if their fundamental facts were right, they are wrong in their interpretation. The only sensible program based upon their own laboriously marshalled exhibits, would be a program of universal education, co-operation, and understanding among all races. The advanced should attempt to educate the backward until all peoples stand upon the same platform of intelligent living. That accomplished, they could sit down together and plan unitedly—instead of the supposedly superior group being constantly under the necessity of manufacturing arms and building battleships to keep the supposedly*

*backward always backward, the ignorant forever ignorant, and the subject forever enslaved.*

"After all, our alleged superiority stretches back merely through a few brief decades. Who knows whether our system is to be the permanent criterion of greatness? Humility will help us. While carrying our culture to other peoples of the world, we might profitably invite them to bring us their systems of thought and their methods of social organization and life. By the mingling and development of the two we shall probably arrive at the true human goal." [The italics are the author's.]

**Individual and Group.**—Just as in the early history of the family the interests of all became more important than the interests of any, so the time is bound to come when the interests of all of the industrial group will become more important than the interests of any part of the group, the interests of the whole state more important than the interests of any division of the state, the interests of the whole nation more important than those of any state, the interests of all nations more important to the world than the interests of any nation.

Each group for itself and the devil take the hindmost cannot serve the best interests of the group any longer. Interdependence makes it impossible. Every group must give to get as the individual must. We must serve in order to be served. The world is filled with examples of commensal groups. Those organisms which aid each other against a common enemy have a much better chance to survive. It has already been pointed out that a live slave was more valuable than a dead enemy. Biology is filled with many instances of two animals serving each other. The pilot fish that swims in front of the shark and directs it to its prey, the bird that picks the teeth of the crocodile and the fleas from its back, are well-known instances of such relationship. There is a mutual interdependence of all

living things. Civilized man could not live without domestic animals. We saw in the first chapter that man is himself made up of more than thirty different kinds of cells each with its particular work to do and if any group fails to do its part trouble arises and sooner or later death ensues.

There is a commensalism existing between nations. No man liveth to himself alone, and no nation can, no race can. The relationship of races is commensal. We need the races who live in the tropics and they need us. Shall we fight to see who is to be supreme? Both are supreme, if both are necessary, one in one line, the other in another line. We invest millions of money in the tropics and those people must be protected in order that they may serve us as we serve them. They live where we cannot. They produce what we cannot. We can invent and manufacture machinery with which they can serve themselves and us. But who made them ours to exploit or who gave us the right to dominate them? Lincoln said something about no man being wise enough or good enough to govern another without the other's consent. Is not the same true of nations?

Not only are we related as commensals when we think of nations and races but we are commensal as groups in our own land. We must have representatives of other races to help us. We must have men of other nationalities to work with and for us. All of the talk about keeping America Nordic, whatever that means, sounds quite academic in the light of our origins and present needs. Before America can be kept Nordic it will have to be made Nordic. There are several millions of Negroes who are as much American as any one here except the real Americans, the Indians. Are they to be made Nordic? If America is to be kept Nordic, then the Nordic must do the menial work of America, and so becomes at once the agent and the victim of his own superior civilization. This he has

never been willing to do and there is no indication that he is willing to begin now. Hence, he will admit to the country those of other nations and races who will do the work for him. Acquaintance and friendship of some will follow. Inter-marriage will result and a new mongrel such as the Nordic is himself will begin to take a hand in the affairs of the community and the state. This has been the experience of men everywhere. Immigration laws may stem the tide for a brief time but immigration laws can never stop the intermingling of races. They can never stop the migratory movements of peoples.

Those who want to keep America Nordic claim a superiority for as much Nordic as there is in us now and as one whose line of descent runs back in England to a time previous to the coming of the Conqueror, I am rejoiced at any real claim for good quality that can be made and substantiated for the "Nordics." But wherein does that superiority rest?

**Race Superiority.**—We have not now and of course never have had any intelligence tests for nations and races. Anthropologists say there are no superior and inferior races. No race is superior by natural capacity to any other race. So far as we can see or understand the qualities and motives with which the primal sympathies deal men are remarkably alike. They are like in all their loves, fears, hates, sorrows. At any rate they are very much more alike than unlike.

The only possible way of forming a larger unit than the family was by an enlargement of the idea of kinship on which the family rests, and thus came the clan, the tribe, the state, the nation, and thus will come the international and the interracial units. The motive for personal sympathy grows out of the intellectual capacity to recognize the essentials of kinship in another.

In the past the American has been characterized by the belief

in the likeness of the neighbor to himself without regard to race, creed, color, or speech, and largely on this foundation has American civilization made whatever contribution it has made to the comity of nations and races. Tribal distinctions have more nearly disappeared here, due largely to widespread education, travel and traditions of democracy, and to the general doctrine of brotherhood, at least in principle. The present tendency, except in a few instances as above noted, is to diminish the attention to blood and race and to put it upon likemindedness. There is in most cases a distinct tendency to break down tribal pride and race hatred, and to increase the size of the group until it becomes world-wide and to develop some scheme for administering world affairs in the interests of the world instead of in the interests of a few nations or races. Each will retain more or less of its ethnic motives, but all will have a common chance in the common life of the world, and none of the supposed inherited differences or inherited qualities shall be allowed to limit those rights or opportunities.

**Likeness of Men.**—Whether or not the anthropologist is correct about the matter, we all know that there are individuals in all races that are very superior to others in the same group and that the mental caliber, the general culture, the ability, etc., make them very much nearer the best in our group than are the lowest in our group and if we were to choose permanent associates we would choose them rather than these of our own group. Likemindedness does not always run in families. It often happens that those who think and feel more nearly like ourselves do not happen to be any blood relation to us at all so far as we can trace. Scientists, literary men, statesmen, business men find a common bond of fellowship often with men of other nations and races who think along the lines of their own interests and so have come to have a common mind about

those interests. When they come to know each other each finds the other quite like himself in all that makes for real men.

Every one of these problems will finally find its solution in the motives and intelligence of men. Motives and intelligence lie in the realm of the psychological. This means that we must understand men before we can understand the problems of relationships of men. This is being realized more largely than ever. Evidence on all sides indicates it. At the last General Conference of the Methodist Episcopal Church held in Springfield, Mass., in May, 1924, it was resolved, "That we repudiate as un-Christian and untrue the idea that certain races are born to inherent, fixed superiority and rulership, while others are born to inherent fixed inferiority and subordination. We stand for the life of open opportunity for all." This is an indication of the mind that is being shown in many directions. The Commission on Interracial Co-operation is trying to replace unreasoning prejudice and suspicion with the Christian spirit of sympathy and helpfulness. These virtues can well stand cultivation by all of us.

**Solution of Problems.**—In approaching these problems with a hope of finding a way to their solution, we must recognize that the one essential is to know the facts in each particular case, all the facts as far as ascertainable. Someone must see the whole problem and if he is a friend of mankind he will suggest a solution in the interests of all concerned. He must be judicially minded. He will not offer a solution that will give him personal advantage. He will tell the truth as he sees it. He will accept a position of leadership only because he believes he can serve those who select him to lead.

Such men, such motives, such service can come only through recognizing the worth of all men, coupled with a determination to sink selfish interests in the interests of all of those involved, knowing that selfishness, envy, hate, jealousy, tend to destroy

those men who harbor them. They will do the same with families and nations. Racial antagonisms, national antagonisms, industrial antagonisms, in the end will rend those who harbor them.

Education in its broadest sense is the source from which solutions must come. Men must know. They must be taught. The process must begin in our schools. There students should be taught to search, to investigate, to choose, and how to wrestle with problems, individual and social, still awaiting solution. It is not enough to teach them how problems of the past have been solved. It is the method they need to know. It is the method of attack upon a problem, the *means whereby* a solution may be reached. No longer is it either wise or sufficient to teach students what they shall believe or *what* they shall think, but they should be taught the method by which beliefs are arrived at, and *how* they should think, not *what*, but *how*.

**The Forum.**—This can never be done by presenting arguments even tho they be based on facts unless opportunity is given on every occasion for those addressed to raise questions and submit additional facts or to question the facts presented or to inquire as to their source. The forum is coming to be recognized as one of the most effective methods of helping people to think and think straight. The stump speaker who can harangue an audience for an hour and make all kinds of extravagant statements, and slip away immediately at the close without giving the audience an opportunity for questions, speaks much more carefully, uses less extravagant statements, if he knows he must conduct a question box at the end. He cannot present conclusions alone then. He must make clear how he arrived at them. He must explain his language, tell what he means by this, that, or the other inference. He can no longer tell the audience what they shall think. He must show them *how he thinks*, and why. They will go away and form

their own conclusions. If this method were more largely employed by ministers, they could be of much more service to their people. Most of them never give the congregation an opportunity to ask questions, hence often they do not know what their people think about religion, the Bible, the church and other questions which the minister regards of so much importance.

When men are taught how to investigate facts, how to get at the truth, and how to discover the motives of those who offer solutions for problems, we shall have gone a long way toward finding solutions and making for peace and goodwill among all men. When a race knows the truth about itself and about all the other races the race problems will be settled. When the employers know and face the whole truth about themselves and about their employees, and vice versa, the difficulties of relationships in industry will be solved.

Turn back to page 306 and read the six *fundamental elements*, putting your family, your church, your lodge, your profession, your community, your nation, your race in with yourself and then picture the world and its problems to your mind. Are there any problems that cannot be solved if those principles are applied? If they were applied a new social order like unto the Kingdom of Heaven would soon come. They can be applied. Will you apply them? Will your social group?

# QUESTIONS

## CHAPTER I

### The Machine the Mind Uses

1. With what does psychology deal?
2. Name some facts that indicate the dependence of mind upon the body.
3. Name some facts to indicate that the body is a machine, or instrument, used by the mind.
4. What is meant by localization of function? In what part of the brain is the area of sight? Hearing?
5. What do you understand *practical* psychology to be?
6. What do you hope to gain by studying the subject mentioned in Question 5?
7. What is a neuron? Name its parts.
8. In what part of the brain is psychology especially interested? Describe that part.
9. Describe the function of nerve fibers.
10. What is meant by association centers?
11. What is the cell theory of life?
12. Define reflex arc, and describe its mechanism.
13. Name two results of man's successful conquest of nature.
14. What do you mean by self-control, or self-mastery?
15. What is meant by differentiation of function in animals?
16. Explain what is meant by "cellular intelligence." How do we know there is life in each cell?
17. Distinguish between mind and consciousness.
18. What is the basis of all human success? Show why.
19. Show why the man has a larger "life" or "livingness" than the dog.
20. Explain what you mean by an "enlarging consciousness." How may consciousness be enlarged?

## CHAPTER 2

## Sense-Perceptive Processes

1. Explain what you mean by sensations being the foundation of knowledge.
2. Describe any experience you have had in which sensations were registered in the nervous system and you were unconscious of them at the time but remembered them later.
3. What do you understand by perception?
4. Show how one's past experience has an influence on determining what a new idea means.
5. Explain why it is that one's knowledge depends upon his environment.
6. Trace briefly the process of "seeing."
7. Define illusion, and describe one from your own experience.
8. What is the cause of illusions?
9. Name two uses of illusions in business not mentioned in the chapter.
10. Explain why it is that one cannot know just what an object or percept means to another.
11. How can you account for the fact that several persons see the same accident and yet describe it so differently?
12. What relation does prejudice have to one's ideas? Illustrate.
13. Show how it is that each one makes his own world.
14. Describe the kind of information furnished one by the sense of hearing.
15. Describe any experience you have had that indicates that the scope of any one of the senses may be broadened by use.
16. What do we mean when we speak of "a world of waves?"
17. Show how an increased knowledge of an object can be secured by employing more than one sense in its study.
18. Is it true that every normal person can know more than he knows now? Why?
19. Describe a process or a game that will develop accuracy in observation. Describe an experience of your own where inaccurate observation gave you an incorrect idea of an object.
20. Name two things that you have determined to do to broaden your viewpoint.

CHAPTER 3

Concepts and Judgments

1. Trace the progress of the mind from indefinite sensations to a knowledge of external objects.
2. Illustrate from your own experience which you recognize more readily, likenesses or differences.
3. Explain why it is an advantage to use a variety of objects when one is learning to count.
4. Explain why *knowing how* in any line does not necessarily mean improvement.
5. Show that mental growth comes only thru effort.
6. Describe the process by which the child comes to distinguish between himself and the outside world.
7. Distinguish between percept and concept and give an example of each.
8. Explain why a concept can contain only the essential qualities of objects.
9. Justify the following statement: "A concept can mean nothing apart from the individuals from which it took its rise."
10. Define and illustrate analysis.
11. Show why synthesis is necessary in forming accurate concepts.
12. Illustrate the process of combining concepts into larger groups. Of what advantage is it?
13. Name the steps in concept formation.
14. Show how the use of language makes for (a) physical economy, (b) mental economy.
15. Explain the importance of concepts in mental growth.
16. Explain why accurate generalizing is a slow process.
17. Discuss the importance of a correct use of words and names.
18. Name a concept you have formed since beginning this book and define the concept.
19. Define and illustrate the mental process called judgment. How can one improve his judgment?
20. Show why the progress of the race depends upon judging. Name an invention or a discovery and show how judgment was related to it.

## CHAPTER 4

## The World of Association

1. State a physiological reason for the inequality of men and show why.
2. Define reaction time.
3. Name the elements or steps involved in reaction time.
4. State briefly the importance *for that* of the association areas of the brain.
5. At what age do the great association areas begin to develop?
6. Explain why mental ability and exact size of one's brain cannot be known from the size of the head.
7. State two facts to show that the latest acquired associations in both the individual and the race are least permanent.
8. How do you explain the fact that anything in consciousness tends to call up something else?
9. State two facts to prove that nothing appears in consciousness without a good reason.
10. Define *association* as used in psychology.
11. What causes association? How can one broaden his association?
12. Show how association of ideas supplements the present by reproduction from past experience.
13. Explain and illustrate with two examples the law of contiguity.
14. Show why contiguity is the basis of all association.
15. Show why association by similarity requires greater mental development than association by contiguity.
16. Discuss briefly the power of association and illustrate by an example.
17. How do you associate torrid and arctic, Spain and New Orleans, England and Rome?
18. Name an instance that you have known about where a wrong association has caused abnormal functioning of some organ of the body.
19. Show that familiarity aids association.
20. What does the fact that association requires time indicate in regard to the activity of subconscious?

## CHAPTER 5

### Memory

1. What does the mind do to sensations when it perceives them?
2. Illustrate the difference between memory and remembering.
3. Discuss the relation between association and memory.
4. Discuss the importance of the training of the senses in relation to remembering.
- 5-6. Define retention, reproduction, recognition, and replacement and show why each is essential to complete remembering.
7. How is it that we sometimes know we have seen a thing and cannot tell where or when?
8. Does absolute forgetting ever occur? Give facts to support your answer.
9. Give reasons for cultivating the logical memory over against the mechanical.
10. Halleck says, "The first rule for securing a better memory is to pay attention to the laws of hygiene, to endeavor by all means to keep the health at high water mark." Justify this statement.
11. Show *how* memory releases us from the present.
12. Show that we have memories instead of memory.
13. Explain why forgetting is quite as essential to mental growth as remembering.
14. Is there a physical basis for memory? Give reasons for your answer.
15. What is meant by a person being eye-minded, ear-minded? How does this show itself in memory?
16. Show how memory enriches one's present experience. Give an illustration.
17. (a) Why are reviews necessary for some things and not for others?  
(b) Why is it better to *think* over than to *read* over in reviewing?
18. Name three rules that one should have in mind in committing things to memory.
19. Have you satisfied yourself that you can remember anything you want to? Recite an experience to illustrate this.
20. "Memory is impartial. It tends to keep the happy man always happy and the miserable man always miserable." Justify this statement.

## CHAPTER 6

## Imagination

- 1-2. Mathematicians today understand Newton's principia with ease but those of his own day did not. Explain why this is and the part that the constructive imagination plays in it.
3. How do you try to cultivate a spirit of openmindedness?
- 4-5. Make a brief study of the mind of some child under five years that you know and give (a) of what he has formed images, (b) to what extent are his images due to his social surroundings, (c) to what extent are they due to the common impulses of childhood?
- 6-7. Here are three words: Typewriter, factory, merchant. Imagine a series of situations in which the three words can be used. Construct six short sentences in which the three words shall be used and each sentence have a meaning different from any of the others.
8. Think of your present position and everything connected with it. State briefly all the ideas for improvements that occur to you.
9. Stop at this point and think of what you expect to be ten years from now. See the entire picture—position, income, family, friends. Now write what seems to be the greatest obstacle in the way of attainment, and how you propose to overcome it, and when you will begin.
10. Do not use paper but imagine you have before you a piece of paper 4 inches square with an edge parallel to the edge of the desk or table nearest you. Imagine you fold the lower right hand corner over upon the upper left and crease the diagonal. Then imagine the upper right corner folded down upon the lower left, and the diagonal creased, and the lower left folded upon the upper left. Then with the paper thus folded, imagine the lower right hand point cut off parallel with the left edge. Draw a figure the shape of the unfolded piece cut off.
11. Distinguish between images and percepts (a) as to clearness, (b) as to control.
12. Discuss the relation of imagination and beliefs.
13. What is the cause of prejudice, or bias, and how can it be removed?
14. Distinguish between image and idea.

- 15-16. What part did imagination play in the mind of the writer of the following?  
"Love is blind and marriage is an eye doctor."—*Greenville Piedmont*.  
"Coal barons' propaganda explaining high prices should be shipped to people using hot air furnaces."—*Brooklyn Eagle*.  
"The significant feature of an American banquet is the dry toast."—*Hartford Times*.  
"America's plan for limitation of navies calls for constructive destruction instead of destructive construction."—*Norfolk Virginian Pilot*.
17. Show the effect of environment upon one's imagination.
18. Discuss the constructive imagination, and name the ways in which it deals with its material.
19. Show that one's monetary value depends upon what he can see with his mind's eye.
20. How do you account for the change in the testimony of witnesses in the trial of Sacco and Vanzetti?

## CHAPTER 7

### Reason or How We Think

1. What is the difference between thinking and day dreaming?
2. Suppose you really believe that fire will not burn you; will it make any difference in your conduct? What?
3. Give in some detail an example of your own thinking?
4. How do you account for a belief in "signs"? Do you know of any such belief that is the result of reflective thought? Give it.
5. One says, "I know it is bad business, but yet I do it." How do you account for such a situation?
6. On reading a problem one person begins writing at once; another sits for a few minutes apparently doing nothing, and then begins to write. Other things being equal, from which would you expect the better result? Why?
7. What is the difference between inference and proof? Illustrate.
8. A little child opens and closes a book and says, "Door! door!" How do you explain it?

9. Why do labor and capital differ so widely in regard to problems of industry?
10. Discuss the law of parsimony in relation to a belief in miracles.
11. Wherein does the real danger lie when reasoning from analogy?
12. Of what use is the syllogism? Name its terms.
13. "Theorizing unless based upon concrete cases is valueless." Show why.
14. Explain why all decisions of the United States Supreme Court are not unanimous.
15. What was the logic of those who burned persons at the stake?
- 16-17. "There are no rigid boundaries for thot. The only possibility of advance for the race is in breaking over the *supposed* boundaries." Show the truth of the above.
18. "Necessity is the mother of invention." Show how *necessity* leads to thinking.
19. Explain why thinking is difficult for us all.
20. Give an example of the use of reason in acquiring knowledge.

## CHAPTER 8

## Will and Habit

- 1-2. Explain why it is that we judge men by their actions rather than by what they say. Is it always right to so judge them? Why?
3. Show why one's will depends to a large extent upon the neuron patterns in the brain.
4. What do you understand to be the basis of habit? Explain.
- 5-6. Show why habit is a time saver. Why not turn all activities, as far as possible, over to habit?
7. Can you give an experience of your own to illustrate "second mental wind"?
- 8-9. Describe an experience of your own in breaking a habit. Give details and results.
10. Discuss "right mental attitude" toward any task or problem as a factor in its accomplishment.
11. Give illustrations of fields in which your reading and study have fitted you to see more than would have been possible without.
12. Can you name any reform movements of the present which are opposed chiefly because men are unwilling to adjust themselves to a new order?

13. Thinking of habit, what is the effect upon thinking when we substitute the word "swiping" for "stealing"?
14. To what extent is one indebted to inheritance, and to what extent to his own will, for his personality?
15. Why may a novelist not have one of his characters suddenly reform?
16. Give examples of the fact that one may slip into bad habits gradually and thoughtlessly.
17. Give two examples from your observation of half-formed habits which were lost because they were not practiced long enough to make them automatic. Was the effort put into them wasted? Why?
18. Explain and justify the statement, "He who would carry the ox must every day shoulder the calf."
19. Name a well known person who has succeeded in spite of difficult circumstances. Explain why.
20. Does one's confidence in his ability *to do* help him *to do*? Why?

## CHAPTER 9

### Interest and Attention

1. Show (*a*) that sensations of which we are conscious depend upon attention; (*b*) that what we remember depends upon attention.
2. Account for the use of *mind* in the following sentence: "I can't put my mind on anything today."
3. Explain why it is that novelty sometimes attracts one's attention and at other times does not.
4. Discuss the influence of the will upon attention.
5. State and illustrate the conditions of voluntary attention. Recite and instance from your own experience.
6. Thinking of attention, how can you account for the miser's love of money?
7. Discuss the influence of bodily conditions upon the attention and illustrate from your own experience.
8. Show the truth or falsity of the following: "The end of education is the development of certain prominent interests of the mind."

- 9-10. Some persons are interested in facts, others in ideas, and still others in ideals. Can you see in what way these interests give a clue to the life work of individuals of the different groups? What general line of activity should each group follow?
11. Thinking of your own experience, what is the secret of interest?
12. Thinking of Sheridan at the battle of the Shenandoah, discuss the effect of enthusiasm on interest and effort.
13. Mention three causes of inattention and lack of interest and show what can be done to remove them.
14. Assume that you are compelled to do a line of work which you thoroughly dislike. Taking a philosophical view of the situation, give details as to how you will adjust yourself and your interests in order that you may profit most in peace of mind and mental growth while doing the work.
15. Below are given two verses. Read them both and state in which you find the strongest involuntary interest aroused and tell why.
- "Lives of great men all remind us  
We can make our lives sublime,  
And, departing, leave behind us  
Foot prints on the sands of time."
- "Lives of great men all remind us  
That no matter what we're worth,  
Each succeeding day will find us  
Striving on to get the earth."
16. To what extent do you find that noises or new environment interfere with your work? What remedy do you apply?
17. Is mind wandering ever justifiable? What is its relation to mental recreation? What is its relation to attention?
18. Do you believe you can carry on a conversation while working without its interfering with your work? Explain why.
19. Explain the importance of maintaining broad interests. Give three suggestions for keeping the interests broad.
20. Give from your own experience detailed facts to show that interest is a test of adaptability.

## CHAPTER 10

### Subconsciousness

1. Explain what you understand by subconsciousness. What is its relation to consciousness?
- 2-3. Discuss the relation of instinctive to intelligent behavior. Which is more powerful? Why?
4. Explain why modern man has greater freedom than the lower animals and than primitive man had.
- 5-6. What do you understand by a "complex"? What results when a mental element is separated from its attendant neuron group pattern?
7. What do you understand by "mental disease"? Name two.
8. Distinguish between nervousness and "nerves" as to cause and effect.
9. What seems to you to have been the cause of Ansel Bourne's loss of identity? Explain your answer.
10. What do you understand to be the difference between organic and functional diseases? What does this difference indicate as to methods of treatment?
- 11-12. Explain what you understand by "suggestion." Show the place it has in one's political ideas. In one's religious ideas.
13. Why are witnesses in court often not allowed to hear each other's testimony?
14. How do you decide whether an experience is an hallucination or an illusion?
- 15-16. What do you understand a dream to be? Of what material must it necessarily be composed? Do you believe that dreams warn one of coming events? Why?
17. What is the underlying principle of hypnosis? Name two misconceptions that have been held in regard to hypnosis.
18. Remembering that one gives suggestions as well as takes them, how shall he meet his responsibility for leadership in home, society, and occupation?
- 19-20. Define—(a) Psychotherapy; (b) Psychoanalysis. Wherein do they differ?

## CHAPTER II

## Conscious Control

- 1-2. When you think of chemical affinity, tropism, gravitation, etc., how do you think of them in relation to God? Do you think of God manifesting Himself more directly through them than He does through you? Explain.
- 3-4. If one can develop physically and mentally only through obeying the laws of the universe, what should be one's attitude toward acquiring and applying a knowledge of these laws? Is one responsible for measuring up to the best he knows or has opportunity to know? Why?
- 5-6. As you think of instinct, habit, choice, what relation do they seem to bear to each other? Does it seem to you that instincts can be modified? Explain.
7. From the viewpoint of psychology why has one not met his full responsibility when he has done as well as, or better than, others have done?
- 8-9. Give an example from your own experience with (a) music, (b) literature, (c) companions to show that your estimate of their value at any one moment is not to be set down as trustworthy. How do you account for this?
- 10-11. Give an example from your own experience in which you have followed your *better judgment* instead of your *first inclination*. Analyze the mental process by which you reached your decision. Do you think it an example of conscious control?
- 12-13. As you think of your experience during the past year, do you find that you are always sure of yourself; that is, do you stand by a decision you have made, or do you *revise* your judgment later? Explain why.
14. How does mood affect the ideas that come into your mind? Are these ideas the cause or the effect of the mood? How can the ideas produced by any certain mood be excluded from consciousness?
- 15-16. What do you regard as the relative importance of inspiration and habit in character building? Can you give an example from your own experience of something you have been inspired to do that under ordinary circumstances you would

not have done? What does this indicate as to one's need of finding new sources of inspiration?

17. One should eat and drink in the interest of health and not of appetite. Discuss the foregoing statement and show what is involved in regard to a need of knowledge of diet.
- 18-19. Thinking of the formation of concepts as discussed in Chapter 3, show how the mind of man is continually led to search for a unity in the universe. Indicate some of the steps that have been taken in that direction. Is the idea of one God consistent with such a search? Why?
20. What is auto-suggestion? Do you think one may increase his ability to accomplish things through auto-suggestion? Can you recite an experience of your own to prove it? What bearing does this have upon "One can become what he wants to be"?

## CHAPTER 12

### Temperaments

1. What do you understand by temperament? Can temperament be modified? Explain.
2. Explain why one cannot always judge another's ability by discovering what that one has accomplished.
3. Distinguish as best you can between knowledge and intelligence.
4. What, in your judgment, is the value of the Army Intelligence Tests? Can you think of a case where their results would not be dependable?
5. Show why there is great need of definite information in regard to the knowledge and intelligence required in the various professions and industrial activities.
6. Thinking of number five, write what you regard as five of the most essential requirements of a successful physician aside from good health.
7. What conclusion may we draw as to the value of education when we study the chart on page 301?
- 8-9. How do you account for the increasing emphasis upon "service" to others, to the community, etc., that is heard on every side today? Does it indicate that the world is getting better? Why?

10. Do you believe one should be judged by the quality of the thoughts he thinks? Are there fashions in thinking as in dressing? Illustrate.
11. Show why from the standpoint of psychology "Deny thyself" is sound teaching.
12. State three reasons why cooperation must succeed competition.
- 13-14. What is the relation of conduct to character? Of ideas to conduct? Of ideals to ideas?
15. Name two reasons why phrenology and physiognomy are not scientific in their attempts to analyze character.
16. Show that vocational guidance properly conceived must do more than select employees for particular positions. It must discover the thing for which the applicant is best fitted and then discover a place where that ability can be used best. What do you understand by *personnel* as used in industry today?
17. Has one a right to pray for something for himself which he must secure at the expense of others, such, for example, as influence, position, wealth? Why?
18. Has one a right to work to secure something he will not pray for? Why?

## CHAPTER 13

## Groups and Races

1. What are social problems? Name three prominent ones of the present time.
2. Show why a new idea is always a product of individual consciousness and not of social consciousness.
3. Name five things that the individual inherits that are social.
- 4-5. Show that social consciousness opposes individual independence. Is this a good thing for the individual? Give reason for your answer.
6. Give two reasons to show that man is better acquainted with the structure of society than he is with its function.
7. Explain why it is difficult to solve social or group problems by law. Of what use then are laws?
8. Show why prejudice is an obstacle in way of a solution of any social or group problem.
9. Wherein does the solution of any such problems lie?

10. What seems to you to lie at the foundation of racial antagonisms?
11. Which of the views given—that in the first quotations, of Judge Gary, or of Bishop Fisher—seems to be most openmindedly and fairly presented? Why?
- 12-13. Do you believe that co-operation is going to supersede competition in national and race relations? Give three reasons for your answer.
14. Do you agree with the resolution of the Methodist General Conference quoted on page 328? Give two reasons for your answer.
- 15-16. Show that it is more important to the student to be taught *how* to think than it is to be taught *what* to think. Illustrate by a concrete case.



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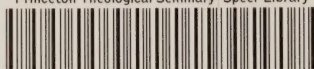


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